de maximis, inc.

Cedar Avenue Business Center
103 North Eleventh Avenue
Suite 210
St. Charles, IL 60174
(630) 443-1940
Fax (630) 443-1942

December 10, 2002

VIA FIRST CLASS MAIL

Mr. Bernard Schorle (HSRL-6)
Waste Management Division
U. S. EPA Region V
77 West Jackson Blvd.
Chicago, IL 60604

Subject: ***Report of Water Quality Conditions, Third Quarter 2002***
Marion (Bragg) Landfill, Marion, Indiana

Dear Mr. Schorle:

On behalf of the Marion (Bragg) Group, please find enclosed three (3) copies of the Report of Water Quality Conditions for the third quarter of 2002, prepared by O&M, Inc., for the subject site.

Please contact me at (630) 443-1940 with any questions on the enclosed reports.

Sincerely,
de maximis, inc.

Gary E. Parker

Enclosures

cc: Resa Ramsey, IDEM (cover plus one copy)
John Hanson, Esq., Beveridge & Diamond, P.C. (cover plus one copy)
Rick Meyers, United Technologies (cover plus one copy)
Dan Garrigan, O&M Inc. (cover via facsimile only)

FILE: 3004-18\3rdqtr_2002rpt.doc

REPORT OF

WATER QUALITY CONDITIONS
THIRD QUARTER 2002
MARION (BRAGG) LANDFILL

MARION, INDIANA

Prepared on Behalf of:

MARION (BRAGG) LANDFILL GROUP

Prepared by:

O & M, Inc.
303 N. Indiana St.
Danville, IN 46122

NOVEMBER 2002

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1.0 INTRODUCTION

This report presents water level data, field water quality measurements and results of laboratory analyses for water samples collected at the Marion (Bragg) Landfill site during the semi-annual monitoring event conducted in September 2002. The monitoring program was designed to document the effectiveness of the landfill cap and is described in detail in the Remedial Action Plan (RAP) (Environmental Resources Management (ERM), 1989, Remedial Action Plan, Marion (Bragg) Landfill Site, Marion, Indiana) and Remedial Design/Remedial Action (RD/RA) Work Plan (Environmental Resources Management, 1989, Remedial Design/Remedial Action Work Plan, Marion (Bragg) Landfill Site, Marion, Indiana).

This sampling event continues to implement a condensed monitoring program after the U.S. Environmental Protection Agency (USEPA) issued a no-further-action Record of Decision for this site. Over Eleven (11) years of monitoring data had been collected, since the start of the monitoring program in January 1990.

With concurrence of the USEPA, the number of sampling locations and parameters has been reduced. Monitoring has been reduced to the following locations: for ground water, MB-1, MB-2, MB-5, MB-6, MB-7, MB-8, MB-9, and MB-10, and for surface water, PW-1, SW-1, SW-5, and SW-6.

The sampling program consisted of sampling the on-site monitoring wells (MB-1, -2, and -5 through -10), the on-site pond (PW-1), the Mississinewa River (SW-1 and SW-5), and Lugar Creek (SW-6) for the Target Compound List (TCL) semi-volatiles, Target Analyte List (TAL) metals (dissolved fraction), and the project specific indicator parameters, total suspended solids (TSS), ammonia-nitrogen (NH_3-N), chemical oxygen demand (COD), and chlorides (Cl). Selected locations of MB-1, MB-2, and SW-1 are sampled for Target Compound List (TCL) volatiles. These parameters and locations

are sampled two (2) times per year. Field parameters (temperature, pH, specific conductance, and dissolved oxygen) are collected at each of the stated sampling locations.

Water quality sampling at the Marion (Bragg) Landfill for the referenced period was performed on September 17th and 18th, 2002. All sampling and analyses were conducted in compliance with the requirements specified in the RD/RA Work Plan (ERM, 1989) and Quality Assurance Project Plan (ERM, 1990, Quality Assurance Project Plan, Remedial Design/Remedial Action, Monitoring and Additional Studies at the Marion (Bragg) Landfill Site, Marion, Indiana).

Copies of the chain-of-custody forms are included in Appendix A and the data validation report is included in Appendix B. Questions regarding specific analytes, concentrations, or qualifiers are addressed in the data validation report.

2.0 SITE CONDITIONS

Sampling event data is presented in attached Tables 1 through 12 and Figures 1 through 7. Review of that data indicates:

- The interpreted groundwater flow directions are the same as presented in previous reports.

- The water levels in wells, ponds, and river continue to follow seasonal trends (Figures 4 to 7). The water level in Monitoring Well (MW-8) was not measured due to obstruction in well. O&M Inc. unsuccessfully attempted to remove blockage and secured with new lock.

- No methane was detected at any site monitoring locations.

- Calculated concentrations of un-ionized ammonia exceeded the chronic aquatic criteria (CAC) in groundwater samples at downgradient locations, MB-2, MB-5, MB-6, MB-7, MB-8 and MB-9. (Table 10). However, after applying the mixing calculation, the concentrations were evaluated as being below the CAC (Table 12).

- The TCL volatile, trichloroethene, was detected in the groundwater sample from the on-site monitoring well, MB-1, at a concentration that exceeds the drinking water Maximum Contaminant Levels (MCLs). However, after applying the mixing calculation, the concentrations were evaluated as being below these criteria (Table 12).

- The TAL metals (dissolved), arsenic and iron were detected in groundwater samples from on-site monitoring wells MB-1, MB-2, MB-5, MB-6, MB-7, MB-8 and MB-9 at concentrations which exceeded the appropriate water quality criteria. However, after applying the mixing calculation, the concentrations dropped below the criteria (Table 12).

3.0 COMMENTS

The following general comments are provided regarding sampling procedures, sample documentation, and the data validation report:

- The data validator noted that the sample PW01PB was not recorded on either COC included in the data package. The COC with PW01PB was faxed and sent to the laboratory via mail on 9/20/02.
- The data valiator noted two copies of COC #061476 included in the data package. The first copy of this COC is the one sent with the samples, the second copy was a corrected one faxed to the laboratory on 9/19/02.
- The data validator noted that VOCs were not specified on the COC for samples SW01PB and SW01DPPB. The previously mentioned second copy of the COC #061476 (corrected) is the result.
- The data validator noted that the pH of the samples were not recorded on the COC upon receipt at the laboratory. The pH of the samples are recorded on the commercial receiving logs attached in Appendix A.
- A copy of the courier airbill is attached to this report as Appendix C
- The data validator noted that matrix spike and matrix spike duplicate (MS/MSD) samples should not be recorded on the COC forms as separate samples, but that extra sample volume should be obtained for the analysis. The sample numbering procedures specified in the Quality Assurance Project Plan (QAPP) calls for the use of a suffix added to distinguish additional sample volumes obtained for MS/MSD analysis. This procedure has been used for all sampling events to date and has proven satisfactory. O&M, Inc. will continue to follow the sample numbering and COC procedures specified in the QAPP until instructed otherwise.

FIGURES

Figure 1
Site Location
Marion (Bragg) Landfill

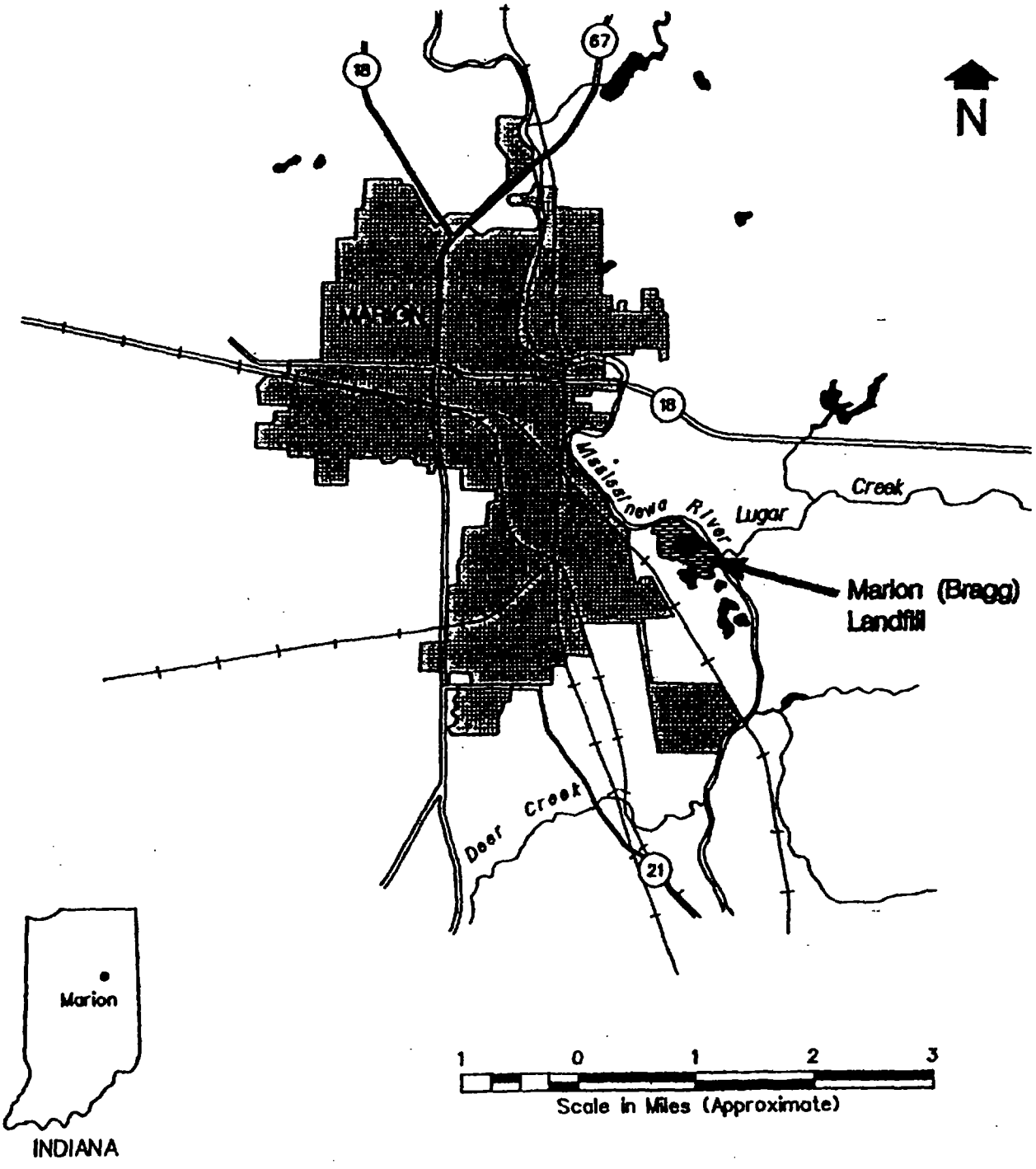
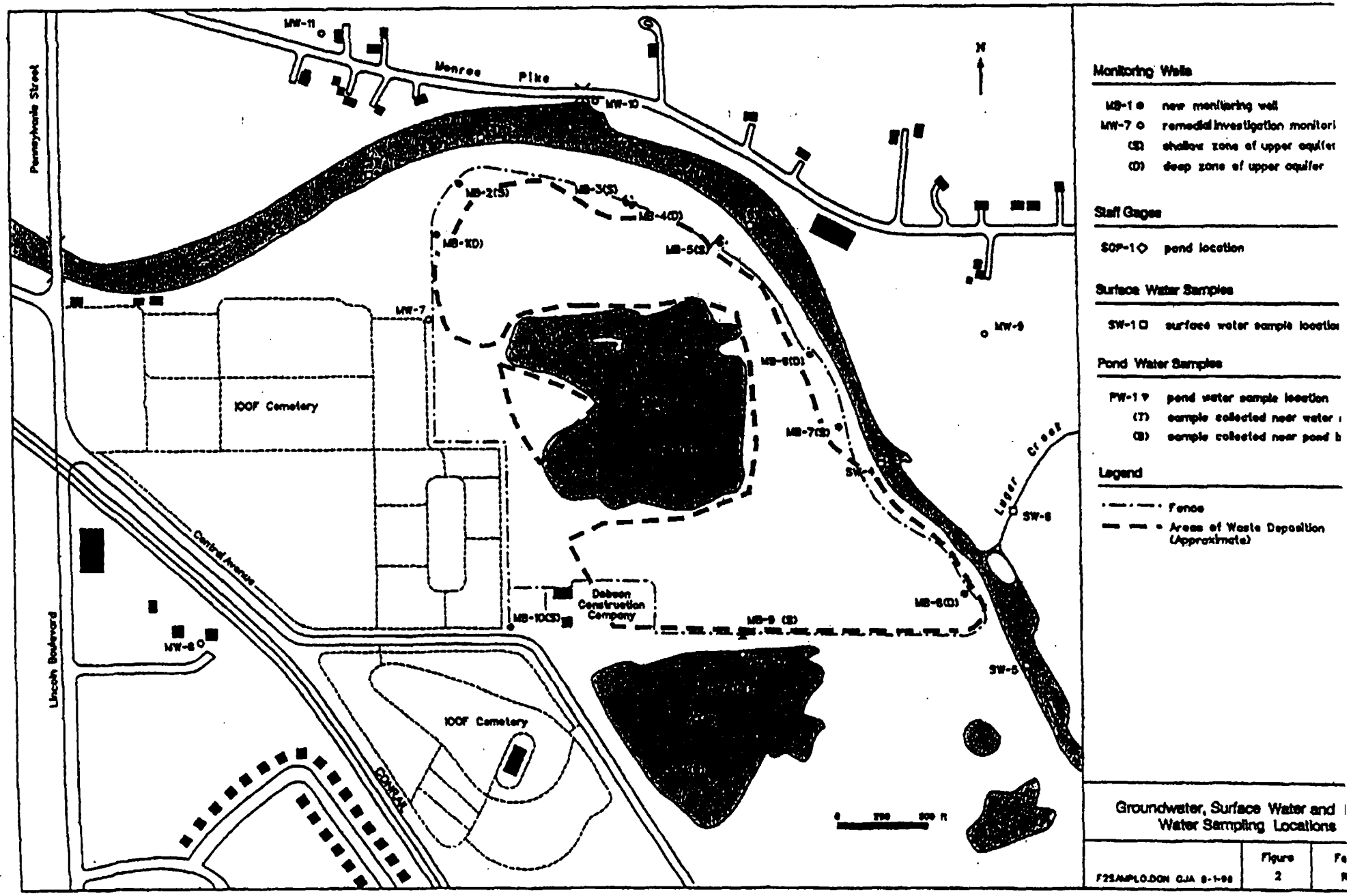


Figure 2
Sampling Locations
Marion (Bragg) Landfill



Groundwater, Surface Water and
Water Sampling Locations

	Figure	
F2SAMPLO.DGN GJA 8-1-96	2	

Figure 3
Groundwater Contour Map
Marion (Bragg) Landfill

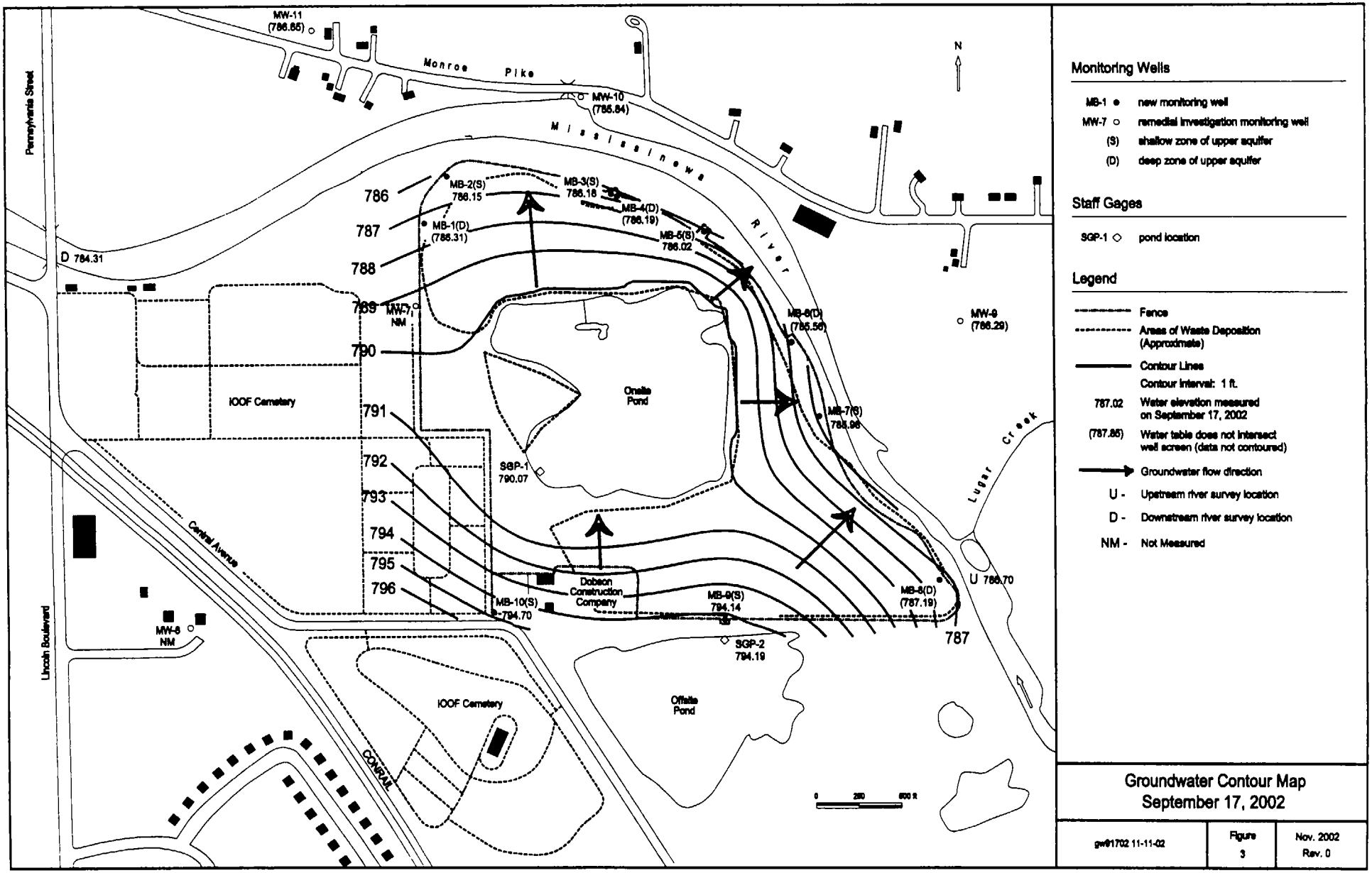


Figure 4. Hydrograph for
Off-site Monitoring Wells

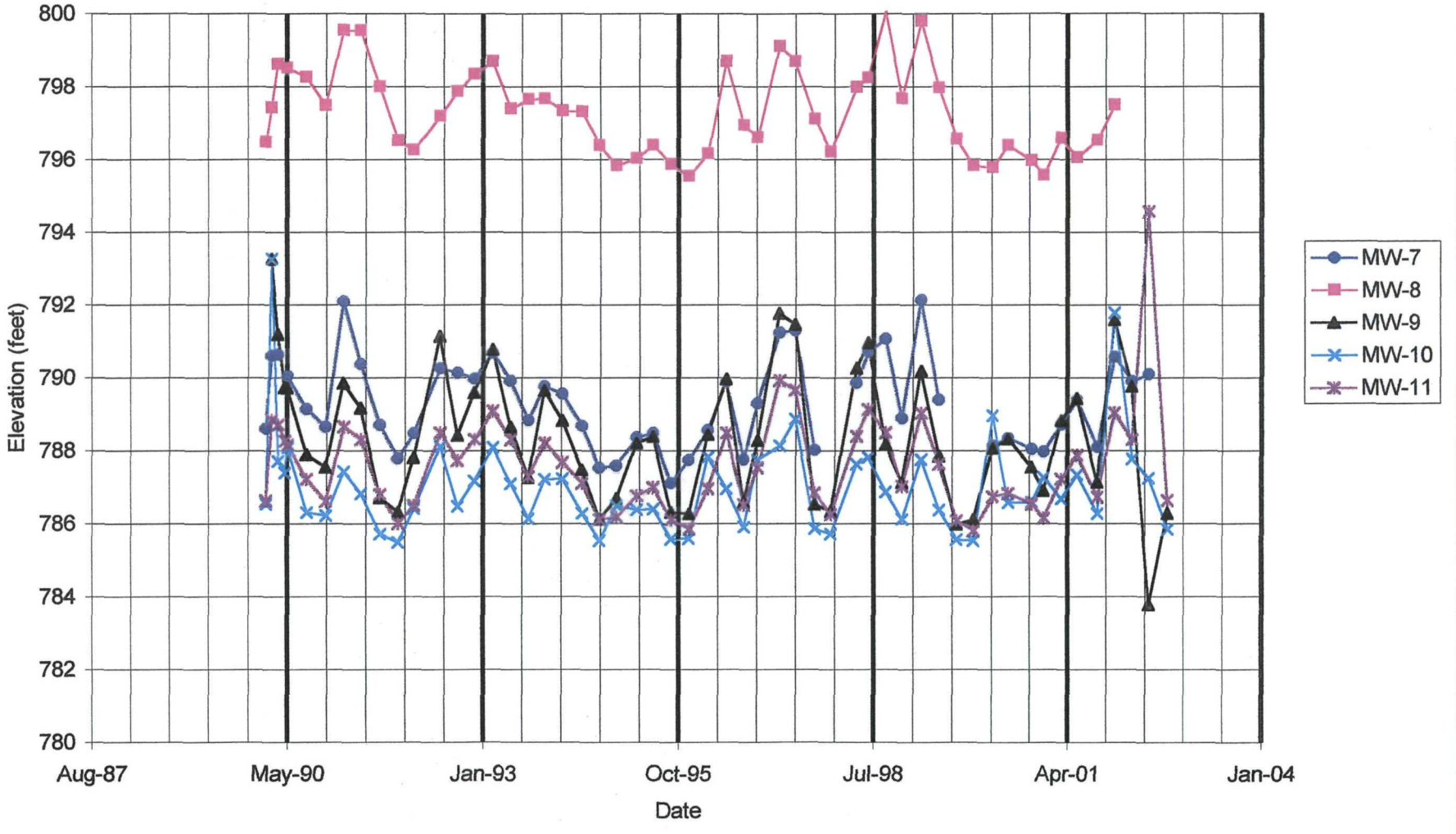


Figure 5. Hydrograph for Shallow,
Upper Aquifer Monitoring Wells

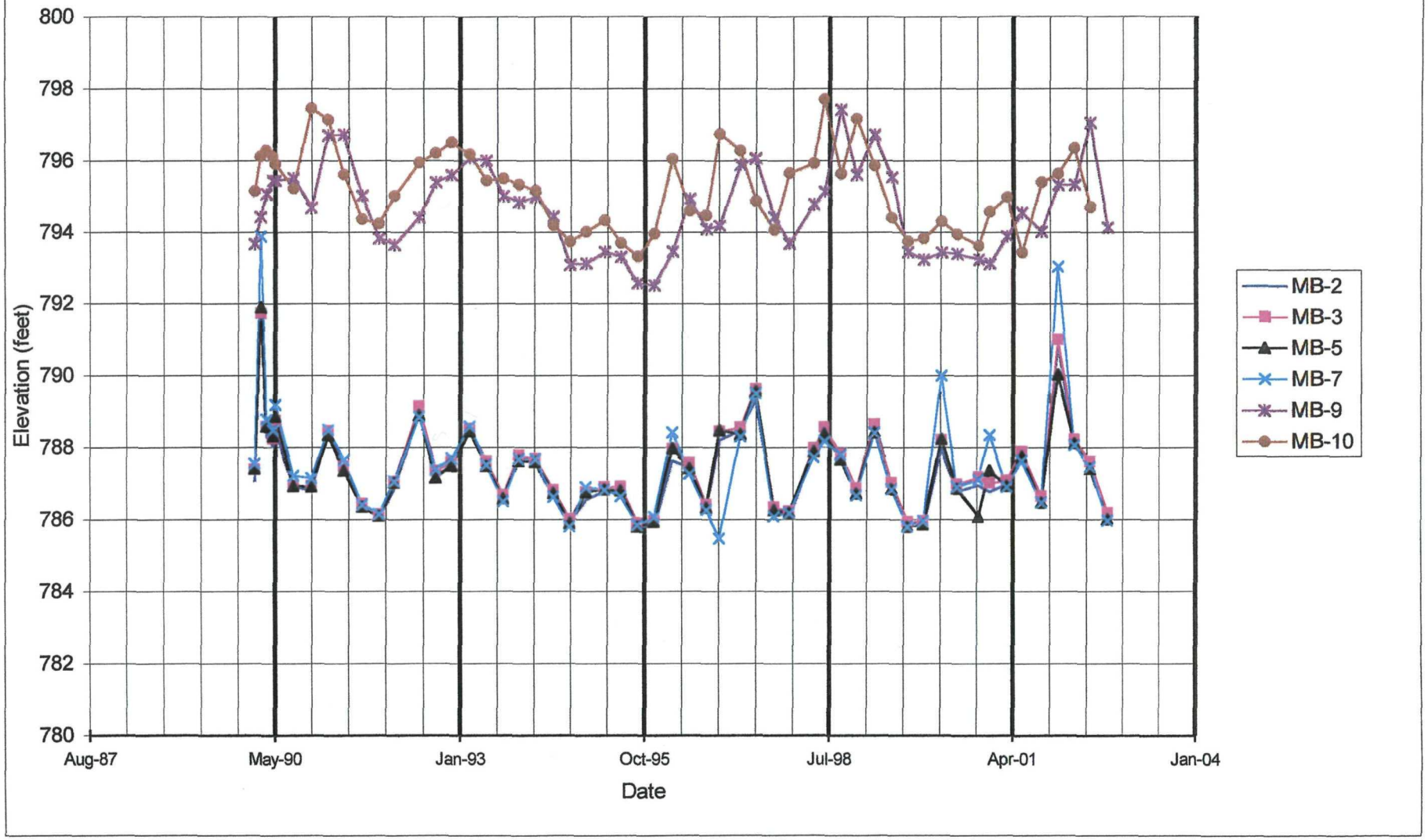


Figure 6. Hydrograph for Deep,
Upper Aquifer Monitoring Wells

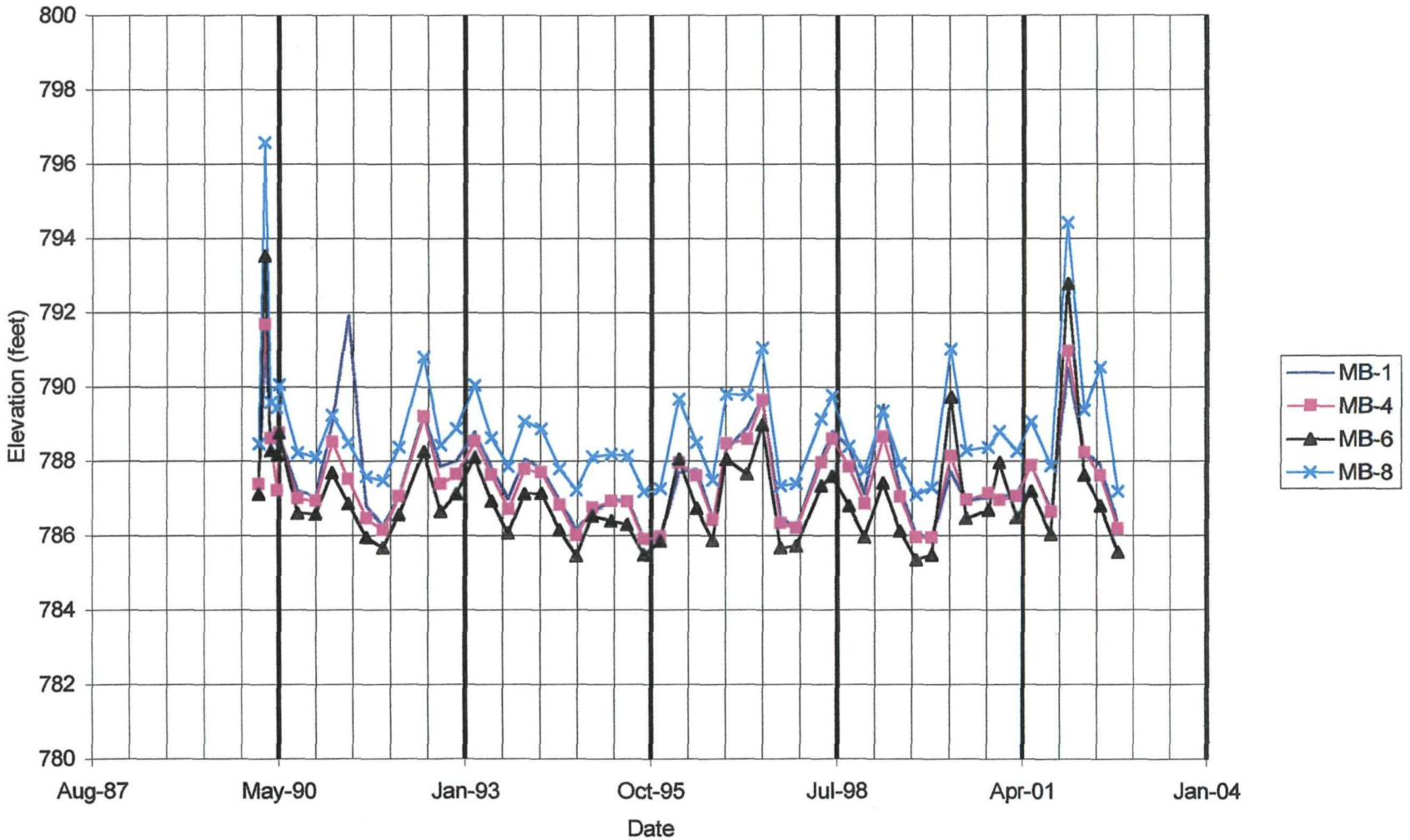
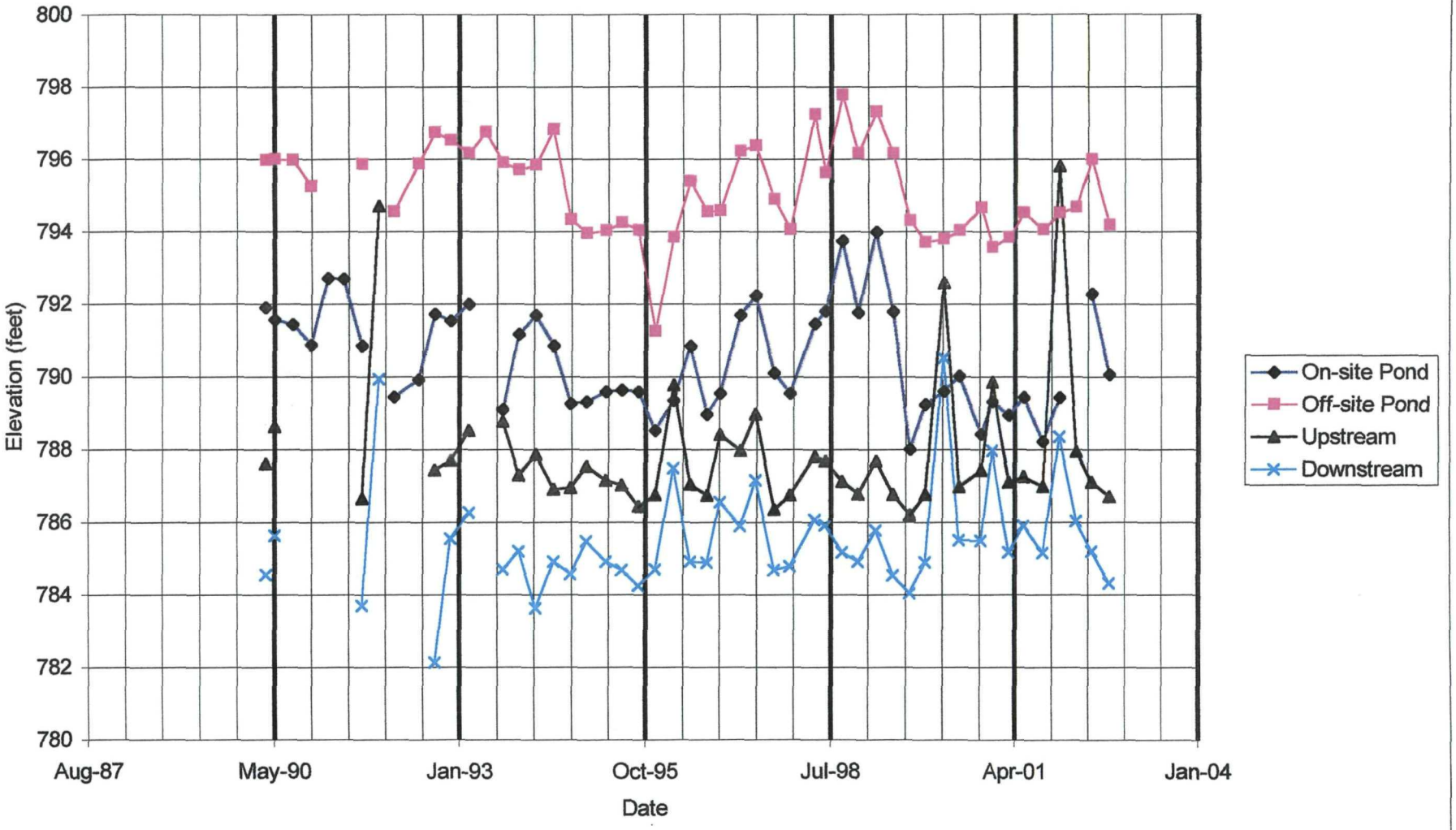


Figure 7. Hydrograph for
Surface Water Locations



TABLES

Table 1

SAMPLE SUMMARY MATRIX - MARION (BRAGG) LANDFILL

Matrix	Number of Samples	Number of Trip Blanks*	Number of Field Blanks*	Number of Field Duplicates	Number of Matrix Spike/ Matrix Spike Duplicate Samples **	Total Matrix	Analyses	Container and Preservation	Holding Times
							LABORATORY		
GROUND WATER (Initial and semiannual sampling. Confirmatory samples shall be taken during the quarter following the sampling event that revealed the presence of a parameter requiring such confirmatory sampling. Sampling is anticipated for 30 years.)	8 (Note 1)	3	1	1	2	13	TCL Volatiles	2-40 ml screw cap vials w/ Teflon-lined septa. HCl to pH < 2. Cool to 4 C.	14 days
							pH Check	1-40 ml screw cap vials w/ Teflon-lined septa. HCl to pH < 2. Cool to 4 C.	28 days
							TCL BNAs	2-1 liter amber glass w/ Teflon lined enclosure. Cool to 4 C.	7 days until extraction, 40 days after extraction.
							Dissolved TAL Metals	Dissolved samples will be field filtered through a 0.45 micron filter prior to preservation. 1-liter plastic HNO3 to pH <2. Cool to 4C.	
							TSS, Chloride, NH3-N	1-liter plastic, Cool to 4C	3 days (TSS) 28 days (Cl) 28 days(NH3-N)
							COD	1-250 ml plastic H2SO4 to pH <2. Cool to 4C	28 days
							FIELD		
							pH, Conductivity D.O. and Temp.	Measure in field to stability before collection.	In field.

Note 1: Wells MB-3 and MB-4 were not sampled this quarter as part of an interim reduced monitored program following a "No further action" ROD.

* - Trip blanks are required for volatile organic analysis at a frequency of one per cooler shipped containing volatile organic analysis.

** - Triple the volume for groundwater and surface water locations will be collected for matrix spike/matrix spike duplicate analyses at a frequency of one per 20 investigative samples. Inorganic analyses will include a single matrix spike and a laboratory duplicate vs. matrix spike duplicate.

Table 1 - Continued

SAMPLE SUMMARY MATRIX - MARION (BRAGG) LANDFILL

Matrix	Number of Samples	Number of Trip Blanks*	Number of Field Blanks*	Number of Field Duplicates	Number of Matrix Spike/ Matrix Spike Duplicate Samples **	Total Matrix	Analyses	Container and Preservation	Holding Times
							LABORATORY		
SURFACE WATER (Initial and semiannual sampling. Confirmatory samples shall be taken during the quarter following the sampling event that revealed the presence of a parameter requiring such confirmatory sampling. Sampling is anticipated for 30 years.)	4 (Note 1)	3	1	1	2	9	TCL Volatiles	2-40 ml screw cap vials w/ Teflon-lined septa. HCl to pH < 2. Cool to 4 C.	14 days
							pH Check	1-40 ml screw cap vials w/ Teflon-lined septa. HCl to pH < 2. Cool to 4 C.	28 days
							TCL BNAs	2-1 liter amber glass w/ Teflon lined enclosure. Cool to 4 C.	7 days until extraction, 40 days after extraction.
							Dissolved TAL Metals	Dissolved samples will be field filtered through a 0.45 micron filter prior to preservation. 1-liter plastic HNO3 to pH <2. Cool to 4C.	
							TSS, Chloride, NH3-N	1-liter plastic, Cool to 4C	3 days (TSS) 28 days (Cl) 28 days(NH3-N)
							COD	1-250 ml plastic H2SO4 to pH <2. Cool to 4C.	28 days
							FIELD		
							pH, Conductivity D.O. and Temp.	Measure in field to stability before collection.	In field.

Note 1: The on-site pond location of PW-2, off-site pond locations of PW-3 and PW-4, and river locations of SW-2, -3, and -4 were not sampled this quarter as part of an interim reduced monitored program following a "No further action" ROD.

* - Trip blanks are required for volatile organic analysis at a frequency of one per cooler shipped containing volatile organic analysis.

** - Triple the volume for groundwater and surface water locations will be collected for matrix spike/matrix spike duplicate analyses at a frequency of one per 20 investigative samples. Inorganic analyses will include a single matrix spike and a laboratory duplicate vs. matrix spike duplicate.

TABLE 2: WATER LEVEL AND METHANE MONITORING DATA, MARION (BRAGG) LANDFILL, SEPTEMBER 17, 2002

Monitoring Location	Top of Casing Elevation (ftamsl)	Stickup (ft)	Ground Surface Elevation (ftamsl)	Methane Concentration (%)	Water Level (ftbtoc)	Water Elevation (ftamsl)
MB-1	799.57	2.50	797.07	0.0	13.26	786.31
MB-2	801.75	2.80	798.95	0.0	15.60	786.15
MB-3	806.15	2.70	803.45	0.0	19.97	786.18
MB-4	805.96	2.60	803.36	0.0	19.77	786.19
MB-5	806.87	3.00	803.87	0.0	20.85	786.02
MB-6	803.58	3.50	800.08	0.0	18.02	785.56
MB-7	812.73	3.00	809.73	0.0	26.75	785.98
MB-8	810.73	3.00	807.73	0.0	23.54	787.19
MB-9	814.73	2.80	811.93	0.0	20.59	794.14
MB-10	822.36	3.10	819.25	0.0	27.66	794.70
MW-7	802.36	2.82	799.54	0.0	0.00	802.36
MW-8 (1)	810.87	3.08	807.79	NM	NM	NM
MW-9	806.04	2.57	803.47	0.0	19.75	786.29
MW-10	803.17	2.27	800.90	0.0	17.33	785.84
MW-11	811.09	2.83	808.26	0.0	24.44	786.65
Staff Gauges	**Elev. at the 0 Mark of Staff Gauge**				**Distance Below 0 Mark of Staff Gauge (2)**	
SGP-1	791.17	NA	NA	NM	1.10	790.07
Staff Gauges	**Top of Staff Gauge Elevation**				**Distance Below Top of Staff Gauge (3)**	
SGP-2	798.16	NA	NA	NM	3.97	794.19
River Elevation	**Benchmark Elevation**				**Surveyed Distance**	
Upstream location (4)	810.73	NA	NA	NM	24.03	786.70
Downstream location (5)	796.94	NA	NA	NM	12.63	784.31

Notes:

Stickup - Measured distance between the ground surface and the top of casing

ftamsl - feet above mean sea level

ftbtoc - feet below top of casing. For staff gauges, valve presented is measurement (in feet) below level of staff gauge.

(1) MW-8 was not measured due to blockage in well.

(2) O&M Inc. reinstalled and resurveyed during the second quarter sampling event.

(3) Pond water level measured from surveyed top of staff gauge down to pond water.

(4) Elevations determined by surveying to known benchmark elevations; benchmark for upstream location MB-8 top of casing.

(5) Elevations determined by surveying to known benchmark elevations; benchmark for downstream location is concrete spillway on east side of McFeeley Bridge.

SGP-1 - On-Site Pond

SGP-2 - Off-Site Pond

NM - Not Measured

NA - Not Applicable

TABLE 3: FIELD WATER QUALITY MEASUREMENTS CONDUCTED DURING WELL PURGING, SEPTEMBER 2002

Well I.D.	Total Depth (ft)	Approx Stickup (ft)	Depth to Water (ftbtoc)	Casing Volume (gal)		Date	Volume Pumped (gal)	pH	Temp (C)	Specific Conductance (umhos/cm) (1)	Specific Conductance (umhos/cm) (2)	Dissolved Oxygen (mg/L)	Conversion Factor (K)
MB-1	37	2.50	13.26	3.85		09/18/02							
							11.5	7.2	17.0	800	943	1.9	0.99
							12.0	7.3	17.0	750	884	2.0	0.99
							12.5	7.3	16.5	700	835	1.9	0.99
MB-2	18	2.80	15.80	0.39		09/18/02							
							1.5	6.9	17.5	820	955	1.3	0.99
							2.0	6.9	17.0	820	966	2.1	0.99
							2.5	7.0	16.5	820	978	1.5	0.99
							3.0	7.0	16.0	820	990	1.6	0.99
							3.5	6.9	16.0	820	990	1.5	0.99
MB-3	24	2.70	17.93	0.98	*		(Well removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision.)						
MB-4	35	2.60	17.74	2.80	*		(Well removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Re n Record of Decision.)						
MB-5	24	3.00	20.85	0.51		09/18/02							
							1.5	7.1	16.0	700	845	3.1	0.99
							2.0	7.1	16.0	680	821	3.0	0.99
							2.5	7.1	16.0	650	785	3.3	0.99
MB-6	28	3.50	18.02	1.62		09/18/02							
							5.0	6.8	17.0	720	849	1.4	0.99
							5.5	6.9	18.0	720	829	1.4	0.99
							6.0	6.9	17.0	700	825	1.5	0.99
MB-7	32	3.0	26.75	0.85		09/18/02							
							2.5	7.0	16.0	800	966	1.3	0.99
							3.0	7.0	16.5	800	954	1.5	0.99
							3.5	7.0	16.5	800	954	1.5	0.99
MB-8	36	3.0	23.54	2.02		09/18/02							
							6.0	7.1	15.5	1170	1430	1.9	0.99
							6.5	7.1	16.0	1170	1413	1.8	0.99
							7.0	7.2	16.0	1180	1425	1.7	0.99

TABLE 3: FIELD WATER QUALITY MEASUREMENTS CONDUCTED DURING WELL PURGING, SEPTEMBER 2002

Well I.D.	Total Depth (ft)	Approx Stickup (ft)	Depth to Water (ftbtoc)	Casing Volume (gal)	Date	Volume Pumped (gal)	pH	Temp (C)	Specific Conductance (umhos/cm) (1)	Specific Conductance (umhos/cm) (2)	Dissolved Oxygen (mg/L)	Conversion Factor (K)
MB-9	29	2.80	20.59	1.36	09/18/02							
						4.0	7.6	17.0	420	495	2.2	0.99
						4.5	7.7	17.0	420	495	2.1	0.99
						5.0	7.7	17.0	400	471	2.2	0.99
MB-10	30	3.10	27.65	0.38	09/18/02							
						1.5	7.3	17.0	700	825	4.9	0.99
						2.0	7.3	15.0	690	854	4.7	0.99
						2.5	7.4	15.0	680	842	4.7	0.99

Notes:
NA - Not Applicable
ftbtoc - feet below top of case
stickup - measured distance between the ground surface and the top of casing
(1) - Field measured conductivity.
(2) - Specific conductance value corrected to 25 C and adjusted using conversion factor (K).

Table 4

Data Qualifier Definitions

Qualifier	Description
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The analyte was positively identified; the numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated value represents its approximate concentration
UJ	The analyte was not detected about the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Table 5
Marion (Bragg) Landfill
Sample Designation Key
Third Quarter 2002 Sampling Event
September 2002

Sample Designation	Sample Location	Parameters	Date Collected
Ground Water			
GW01CJ	MB-10	TSS, Cl^-, COD, NH_3-N, Dissolved metals, SVOCs	09/18/02
GW02CJ	MB-9	TSS, Cl^-, COD, NH_3-N, Dissolved metals, SVOCs	09/18/02
GW03CJ	MB-5	TSS, Cl^-, COD, NH_3-N, Dissolved metals, SVOCs	09/18/02
GW04CJ	MB-6	TSS, Cl^-, COD, NH_3-N, Dissolved metals, SVOCs	09/18/02
GW05CJ	MB-7	TSS, Cl^-, COD, NH_3-N, Dissolved metals, SVOCs	09/18/02
GW06CJ	MB-8	TSS, Cl^-, COD, NH_3-N, Dissolved metals, SVOCs	09/18/02
GW07CJ	MB-2	TSS, Cl^-, COD, NH_3-N, Dissolved metals, VOCs, SVOCs	09/18/02

Table 5 Continued

Sample Designation	Sample Location	Parameters	Date Collected
GW08CJ	MB-1	TSS, Cl^-, COD, NH_3-N, Dissolved metals, VOCs, SVOCs	09/18/02
GW08DPCJ	MB-1	TSS, Cl^-, COD, NH_3-N, Dissolved metals, VOCs, SVOCs	09/18/02
GW08MSCJ	MB-1	TSS, Cl^-, COD, NH_3-N, Dissolved metals, VOCs, SVOCs	09/18/02
GW08MSDCJ	MB-1	TSS, Cl^-, COD, NH_3-N, Dissolved metals, VOCs, SVOCs	09/18/02
GW09FBCJ	Field Blank	TSS, Cl^-, COD, NH_3-N, Dissolved metals, VOCs, SVOCs	09/18/02
GW10TBCJ	Trip Blank	VOCs	09/18/02
Pond Water			
PW01CJ	PW-1 (On-site shallow)	TSS, Cl^-, COD, NH_3-N, Dissolved metals, SVOCs	09/17/02

Table 5 Continued

Sample Designation	Sample Location	Parameters	Date Collected
River Water			
SW01CJ	SW-1 (Downstream)	TSS, Cl^-, COD, NH_3-N, Dissolved metals, VOCs, SVOCs	09/17/02
SW01DPCJ	SW-1 (Downstream)	TSS, Cl^-, COD, NH_3-N, Dissolved metals, VOCs, SVOCs	09/17/02
SW01MSCJ	SW-1 (Downstream)	TSS, Cl^-, COD, NH_3-N, Dissolved metals, VOCs, SVOCs	09/17/02
SW01MSDCJ	SW-1 (Downstream)	TSS, Cl^-, COD, NH_3-N, Dissolved metals, VOCs, SVOCs	09/17/02
SW02CJ	SW-5 (Upstream)	TSS, Cl^-, COD, NH_3-N, Dissolved metals, SVOCs	09/17/02
SW03CJ	SW-6 (Lugar Creek)	TSS, Cl^-, COD, NH_3-N, Dissolved metals, SVOCs	09/17/02
SW04TBCJ	Trip Blank	VOCs	09/17/02

Table 6: GROUNDWATER CHEMISTRY DATA, SEPTEMBER 2002

MONITORING WELL LOCATION IN AQUIFER	MB-1 BOTTOM	MB-2 TOP	MB-5 TOP	MB-6 BOTTOM	MB-7 TOP	MB-8 BOTTOM	MB-9 TOP	MB-10 TOP	DUPLICATE (MB-1)
TCL VOLATILES (ug/L)									
Acetone	10 U	10 UJ	NA	NA	NA	NA	NA	NA	10 U
Benzene	10 U	10 U	NA	NA	NA	NA	NA	NA	10 U
Chlorobenzene	10 UJ	1 J	NA	NA	NA	NA	NA	NA	10 U
Total 1,2-Dichloroethene	5 J	3 J	NA	NA	NA	NA	NA	NA	5 J
Trichloroethene	56 J	10 U	NA	NA	NA	NA	NA	NA	65
Vinyl Chloride	0.9 J	10	NA	NA	NA	NA	NA	NA	0.9 J
Carbon Disulfide	10 U	0.4 J	NA	NA	NA	NA	NA	NA	10 U
VOLATILE TENTATIVELY IDENTITFIED COMPOUNDS (Retention Time) (1)									
None detected									
TCL SEMIVOLATILES (ug/L)									
bis(2-Ethylhexyl)phthalate	9 U	9 U	9 U	10 U	10 U	9 U	9 U	9 U	9 U
Hexachlorocyclopentadiene	9 U	9 U	9 U	10 U	10 U	9 U	9 U	9 U	9 U
2,4-Dinitrophenol	9 U	9 U	9 U	10 U	10 U	9 U	9 U	9 U	9 U
Caprolactam	9 U	9 U	3 J	10 U	10 U	9 U	9 U	9 U	9 U
Diethylphthalate	9 U	0.2 J	9 U	10 U	10 U	9 U	9 U	9 U	9 U
SEMIVOLATILE TENTATIVELY IDENTIFIED COMPOUNDS (Retention Time) (1)									
Unknown	3 J	19 J	4 J	38 J	2 J	115 J	5 J	99 J	
Phenol, tert-butyl-isomer		3 J							
Diethyltoluamide			71 NJ					9 NJ	
4,4'-(1-Methylethylidene)bis phenol				3 NJ					
Phthalic anhydride						3 NJ			
2,4-dichloro-1-(trichloromethyl)benzene						5 NJ			
Unknown acid ester									
2(3H)-Benzothiazolone				10 NJ					
1,4,5,6,7,7-hexachloro-bicyclo(2-2-1)hept-5-ene-2,3-dicarboxylic acid						9 NJ			
Sulfur			11 NJ						

Table 6: GROUNDWATER CHEMISTRY DATA, SEPTEMBER 2002

MONITORING WELL	MB-1	MB-2	MB-5	MB-6	MB-7	MB-8	MB-9	MB-10	DUPLICATE (2)
LOCATION IN AQUIFER	BOTTOM	TOP	TOP	BOTTOM	TOP	BOTTOM	TOP	TOP	(MB-1)
DISSOLVED TAL METALS (ug/L)									
Aluminum	23.4 U	49.7 U	24.8 U	23 U	16.5 U	2410	36.7 U	21.5 U	36.7 U
Antimony	2.2 U	2.3 U	1.8 U	2.9 U	1.7 U	1.7 U	1.7 U	1.9 U	1.7 U
Arsenic	9.0	87.6	23.7	124	74.8	135	10.4 J	2.5 U	8.2 J
Barium	193	514	389	371	590	311	66.9	94.7	189
Beryllium	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.28 U	0.20 U	0.20 U	0.20 U
Cadmium	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
Calcium	118000	129000	94400	117000	98100	137000	57700	111000	116000
Chromium	0.40 UJ	0.40 UJ	0.40 UJ	0.40 UJ	0.40 UJ	8.0	0.40 UJ	0.40 UJ	0.40 UJ
Cobalt	1.9 J	1.5 J	1.6 J	1.5 J	0.40 UJ	3.1	0.40 UJ	0.40 UJ	1.4 J
Copper	0.80 UJ	0.80 U	0.80 UJ	0.80 UJ	0.80 U	18.9	0.80 UJ	0.80 UJ	0.80 U
Iron	1520	19600	7900	16100	11000	18200	2080	8.6 UJ	1510
Lead	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ	30.3	1.3 UJ	1.3 UJ	1.3 UJ
Magnesium	32800	29100	26800	28600	32500	87200	20700	34300	32200
Manganese	901	133	191	82.3	68.2	276	505	1.5 U	698
Mercury	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 UJ	0.10 U
Nickel	1.6 J	1.6 J	2.2 J	10.8 J	0.72 J	11.5 J	0.60 UJ	0.60 UJ	1.5 J
Potassium	3160	10600	6570	10300	15400	27400	1620	2740	3090
Selenium	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ
Silver	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Sodium	12600 J	17000 J	15600 J	13100	31900 J	112000 J	8600 J	11800 J	12100
Thallium	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U
Vanadium	0.30 U	0.30 UJ	0.30 UJ	0.30 UJ	0.30 UJ	5.6	0.30 UJ	0.30 UJ	0.30 UJ
Zinc	3.1 U	5.1 U	7.0 U	6.1 U	8.1 U	80.8	3.1 U	6.4 U	11.60 U
INDICATOR PARAMETERS (mg/L)									
Ammonia-Nitrogen	0.10 U	7.3	4.1	3.8	6.8	5.3	0.52	0.10 U	0.10 U
Chemical Oxygen Demand	10.0 U	21.3	10.4	16.9	25.6	64.8	10.0 U	10.0 U	10.0 U
Chloride	20.6	18.9	16.7	13.2	23.6	27.3	27.3	23.0	20.3
Total Suspended Solids	7.8	12.4	16.6	23	31.2	44.8	52.8	70.2	6.2

Notes:

NA - Not analyzed; parameter removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision.
Sampling locations, MB-3 and MB-4, removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision.

(1) Unknown Tentatively Identified Compounds (TICs) are summed or totaled by the number of unknown TICs and by the concentration of unknown TICs. TICs for which a compound class (e.g., unknown phtalate) or individual compound (e.g., 1H-Benzotriazole) are identified, those compounds are listed separately with concentration and data qualifier and are not included in the total number or total concentration. The unknown TICs were totaled to provide condensed summary information in the data table. Any questions regarding specific unknown TICs can be investigated in the data validation report.

Table 7: POND WATER CHEMISTRY DATA, SEPTEMBER 2002

SAMPLING LOCATION	OFFSITE POND	OFFSITE POND	ONSITE POND	ONSITE POND
LOCATION IN MATRIX	BOTTOM (PW-4)	TOP (PW-3)	BOTTOM (PW-2)	TOP (PW-1)
TCL VOLATILES (ug/L)				
NA	NA	NA	NA	NA
VOLATILE TENTATIVELY IDENTIFIED COMPOUNDS (Retention Time)				
NA	NA	NA	NA	NA
TCL SEMIVOLATILES (ug/L)				
NONE DETECTED				
SEMIVOLATILE TENTATIVELY IDENTIFIED COMPOUNDS (Retention Time) (1)				
Diethyltolumide	NA	NA	NA	2 NJ
DISSOLVED TAL METALS (ug/L)				
Aluminum	NA	NA	NA	57.7 U
Antimony	NA	NA	NA	1.6 U
Arsenic	NA	NA	NA	3.3 J
Barium	NA	NA	NA	104 J
Beryllium	NA	NA	NA	0.20 U
Cadmium	NA	NA	NA	0.20 U
Calcium	NA	NA	NA	35700
Chromium	NA	NA	NA	0.60 U
Cobalt	NA	NA	NA	0.40 U
Copper	NA	NA	NA	0.60 U
Iron	NA	NA	NA	6.7 U
Lead	NA	NA	NA	0.70 U
Magnesium	NA	NA	NA	30100
Manganese	NA	NA	NA	0.50 U
Mercury	NA	NA	NA	0.10 U
Nickel	NA	NA	NA	1.9 U
Potassium	NA	NA	NA	4410 J
Selenium	NA	NA	NA	2.9 U
Silver	NA	NA	NA	0.70 U
Sodium	NA	NA	NA	18100
Thallium	NA	NA	NA	2.6 U
Vanadium	NA	NA	NA	0.40 UJ
Zinc	NA	NA	NA	0.70 UJ
INDICATOR PARAMETERS (mg/L)				
Ammonia-Nitrogen	NA	NA	NA	0.10 U
Chemical Oxygen Demand	NA	NA	NA	21.3
Chloride	NA	NA	NA	21.4
Total Suspended Solids	NA	NA	NA	9.6
FIELD PARAMETERS				
Temperature (C)	NA	NA	NA	25.0
pH	NA	NA	NA	6.54
Conductivity (umhos/cm) (2)	NA	NA	NA	490
Conductivity (umhos/cm) (3)	NA	NA	NA	466
Dissolved Oxygen (mg/L)	NA	NA	NA	6.7

Notes:

NA - Not analyzed; parameter removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision. Sampling locations, PW-2, PW-3, and PW-4, removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision.

ND - Not Detected

(1) Unknown Tentatively Identified Compounds (TICs) are summed or totaled by the number of unknown TICs and by the concentration of unknown TICs. TICs for which a compound class (e.g., unknown phtalate) or individual compound (e.g., 1H-Benzotriazole) are identified, those compounds are listed separately with concentration and data qualifier and are not included in the total number or total concentration. The unknown TICs were totaled to provide condensed summary information in the data table. Any questions regarding specific unknown TICs can be investigated in the data validation report.

(2) - field measured specific conductivity at ambient temperature

(3) - specific conductivity corrected to 25 degrees C.

Table 8: SURFACE WATER CHEMISTRY DATA, SEPTEMBER 2002

LOCATION	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	DUPLICATE
	Downstream	Adjacent	Adjacent	Adjacent	Upstream	Lugar Creek	(SW-1)
TCL VOLATILES (ug/L)							
	ND	NA	NA	NA	NA	NA	ND
VOLATILE TENTATIVELY IDENTIFIED COMPOUNDS (Retention Time)							
	ND	NA	NA	NA	NA	NA	ND
TCL SEMIVOLATILES (ug/L)							
	ND	NA	NA	NA	ND	ND	ND
SEMIVOLATILE TENTATIVELY IDENTIFIED COMPOUNDS (Retention Time) (1)							
	ND	NA	NA	NA	ND	ND	ND
DISSOLVED TAL METALS (ug/L)							
Aluminum	57.7 U	NA	NA	NA	57.7 U	57.7 U	57.7 U
Antimony	60.0 U	NA	NA	NA	1.6 U	1.6 U	1.6 U
Arsenic	2.9 J	NA	NA	NA	1.5 J	1.3 U	2.1 J
Barium	108 J	NA	NA	NA	97.6 J	69.7 J	99.4 J
Beryllium	0.20 U	NA	NA	NA	0.20 U	0.20 U	0.20 U
Cadmium	0.20 U	NA	NA	NA	0.20 U	0.20 U	0.20 U
Calcium	86400	NA	NA	NA	84000	98900	85200
Chromium	10.0 U	NA	NA	NA	0.78 J	0.60 U	0.60 U
Cobalt	50.0 U	NA	NA	NA	0.40 U	0.40 U	0.40 U
Copper	2.9 J	NA	NA	NA	1.3 J	1.1 J	1.5 J
Iron	8.7 U	NA	NA	NA	8.7 U	8.7 U	8.7 U
Lead	0.70 U	NA	NA	NA	0.70 U	0.70 U	0.70 U
Magnesium	36600	NA	NA	NA	36300	42900	36300
Manganese	12.2	NA	NA	NA	8.8	46.9	11.6
Mercury	0.10 U	NA	NA	NA	0.10 U	0.10 U	0.10 U
Nickel	2.9 J	NA	NA	NA	1.1 J	0.80 U	2.1 J
Potassium	3400 J	NA	NA	NA	3290 J	2450 J	3370 J
Selenium	3.6 U	NA	NA	NA	2.9 U	2.9 U	2.9 U
Silver	0.70 U	NA	NA	NA	0.70 U	0.70 U	0.70 U
Sodium	44100	NA	NA	NA	42900	24700	43900
Thallium	2.6 U	NA	NA	NA	2.6 U	2.6 U	2.6 U
Vanadium	2.9 J	NA	NA	NA	0.40 UJ	0.40 UJ	0.8 J
Zinc	0.70 UJ	NA	NA	NA	2.5 J	0.70 UJ	20.0 U
INDICATOR PARAMETERS (mg/L)							
Ammonia-Nitrogen	R	NA	NA	NA	0.10 U	0.10 U	R
Chemical Oxygen Demand	10 U	NA	NA	NA	10 U	10 U	10 U
Chloride	75.1	NA	NA	NA	79.3	41.7	76.5
Total Suspended Solids	9.9	NA	NA	NA	13.6	1	8.2
FIELD PARAMETERS							
Temperature (C)	26.0	NA	NA	NA	23.0	20.0	26.0
pH	8.21	NA	NA	NA	8.35	8.19	8.21
Conductivity (umhos/cm) (2)	800	NA	NA	NA	800	780	800
Conductivity (umhos/cm) (3)	746	NA	NA	NA	793	825	746
Dissolved Oxygen (mg/L)	6.81	NA	NA	NA	7.47	7.07	6.81

Notes:

NA - Not analyzed; parameter removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision. Sampling locations, SW-2, SW-3, and SW-4, removed from water quality monitoring program as part of a condensed monitoring program following a no-further-action Record of Decision.

NR - Not recorded

ND - Not Detected

(1) Unknown Tentatively Identified Compounds (TICs) are summed or totaled by the number of unknown TICs and by the concentration of unknown TICs. TICs for which a compound class (e.g., unknown phtalate) or individual compound (e.g., 1H-Benzotriazole) are identified, those compounds are listed separately with concentration and data qualifier and are not included in the total number or total concentration. The unknown TICs were totaled to provide condensed summary information in the data table. Any questions regarding specific unknown TICs can be investigated in the data validation report.

(2) - field measured specific conductivity at ambient temperature

(3) - specific conductivity corrected to 25 degrees C.

TABLE 9: WATER QUALITY CRITERIA - UPDATED 2000

Parameter	Acute Aquatic Criteria		Chronic Aquatic Criteria		Human Health		MCL	
TCL Volatiles (ug/L)								
Acetone	10000	+	222	+	--		--	
Benzene	5300	E	118	+	400	I	5	E
Chlorobenzene	1950	+	50	E	2026	+	--	
1,2-Dichloroethene (total) (1)	--		--		--		70 and 100	E
Methylene Chloride	193000	E	4289	+	157	E	--	
Toluene	17500	E	389	+	424000	I	1000	E
Trichloroethene	45000	E	21900	E	807	I	5	E
Vinyl Chloride	--		--		5246	I	2	E
TCL Semivolatiles (ug/L)								
Phenol	10200	E	2560	E	3500	E	--	
Phthalate Esters	940	E	3	E	50000	I	--	
TAL Metals and Cyanide (ug/L)								
Aluminum	--		--		--		--	
Antimony	--		--		45000	I	6	E
Arsenic	360	I	190	I	0.175	I	50	E
Barium	--		--		--		2000	E
Beryllium	--		--		1.17	I	4	E
Cadmium*	6.7	I	1.6	I	60	+	5	E
Calcium	--		--		--		--	
Chromium	16	I	11	I	3389	+	100	E
Cobalt	--		--		--		--	
Copper* (2)	28	I	18	I	--		1300	E
Cyanide	22	I	5.2	I	24242	+	200	E
Iron	1000	E	--		--		--	
Lead* (2)	150	I	5.8	I	51	+	15	E
Magnesium	--		--		--		--	
Manganese	--		--		--		--	
Mercury	2.4	I	0.012	I	0.15	I	2	E
Nickel*	2100	I	240	I	100	I	100	E
Potassium	--		--		--		--	
Selenium	130	I	25	I	--		50	E
Silver*	9.2	I	0.12	E	--		50	E
Sodium	--		--		--		--	
Thallium	--		--		48	I	2	E
Vanadium	11000	+	100	+	--		--	
Zinc*	175	I	180	I	--		--	
IDEM Parameters (mg/L)								
Ammonia, Total Unionized**	0.027	I	0.0029	I	--		--	
COD	--		--		--		--	
Chloride	860	I	230	I	--		--	
TSS	--		--		--		--	

Notes:

*Acute and chronic criteria calculated based on worst-case hardness=161 mg/L
**Acute and chronic criteria calculated based on worst-case t=5C, pH=7.0
-- Criteria not developed
MCL - Maximum Contaminant Level (Updated per the Safe Drinking Water Act of 1986 and later revisions known as the Phase I, Phase II, and Phase V rules. Phase I became effective January 9, 1989, Phase II became effective in 1992, and Phase V became effective January 17, 1994.)
Source of Data
E - U.S. EPA
I - IDEM (327 IAC 2)
+ - See section 6.2 of February 1990 report by Beak Consultants Limited Baseline Water Quality Conditions for discussion of sources for the criteria.
(1) The 1,2-Dichloroethene MCL standards are divided into cis-1,2-Dichloroethene at 70 ug/L and trans-1,2 Dichloroethene at 100 ug/L.
(2) - The "MCL" value is an action level for lead and copper (i.e., the lead and copper rule) but it only applies to water supplies as measured at the household tap.

TABLE 10: CALCULATED ACUTE AQUATIC CRITERIA AND CHRONIC AQUATIC CRITERIA FOR AMMONIA-NITROGEN, SEPTEMEBR 2002

Sample Matrix	Well Number	pH	Temp (C)	Total Ammonia in Sample (mg/L)	Calculated Un-Ionized Ammonia (in Sample) (mg/L)*	Calculated Un-Ionized Ammonia Criteria (mg/L)**		Criteria Exceeded	
						AAC	CAC	AAC	CAC
Ground Water	MB-1	7.3	16.5	0.10 U	0.0003	0.087	0.0114	No	No
	MB-2	6.9	16.0	7.3	0.0187	0.052	0.0054	No	Yes
	MB-5	7.1	16.0	4.1	0.0163	0.071	0.0084	No	Yes
	MB-6	6.9	17.0	3.8	0.0100	0.054	0.0055	No	Yes
	MB-7	7.0	16.5	6.8	0.0213	0.061	0.0066	No	Yes
	MB-8	7.2	16.0	5.3	0.0220	0.073	0.0088	No	Yes
	MB-9	7.7	17.0	0.52	0.0089	0.149	0.0367	No	No
	MB-10	7.4	15.0	0.10 U	0.0003	0.094	0.0142	No	No
	Duplicate+	7.3	16.5	0.10 U	0.0003	0.087	0.0114	No	No
Pond Water	On-site (S)	8.5	25.0	0.10 U	0.0082	0.352	0.4016	No	No
Surface Water	SW-1	8.2	26.0	U	0.0000	0.350	0.2013	No	No
	Duplicate++	8.2	26.0	U	0.0000	0.350	0.2013	No	No
	SW-5	8.4	23.0	0.10 U	0.0050	0.296	0.2259	No	No
	SW-6	8.2	20.0	0.10 U	0.0029	0.230	0.127	No	No

Notes:

* - Values calculated according to the Indiana Register (1990) (327 IAC 2). Unionized values calculated using 1/2 the detection limit for less than detection limit total results.

** - *Calculated according to the USEPA Quality Criteria for Water, 1986 EPA 440/5-86-001(as revised by Water Quality Criteria and Standards Activity Report, August 1992)*

\+ - Readings taken from monitoring well MB-1

++ - Readings taken from surface water sample location SW-1.

AAC - Acute Aquatic Criteria

CAC - Chronic Aquatic Criteria

TABLE 11: ACUTE AQUATIC CRITERIA AND CHRONIC AQUATIC CRITERIA FOR TAL METALS CONCENTRATIONS DEPENDENT ON HARDNESS, SEPTEMBER 2002

Sample Matrix	Sample Location	Hardness (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Cadmium (ug/L) Sample Conc.**		AAC*	CAC*	Chromium (ug/L) Sample Conc.**		AAC*	CAC*	Copper (ug/L) Sample Conc.**		AAC*	CAC*	Lead (ug/L) Sample Conc.**		AAC*	CAC*	Nickel (ug/L) Sample Conc.**		AAC*	CAC*	Silver (ug/L) Sample Conc.**		AAC*	Zinc (ug/L) CAC(1); Sample Conc.**		AAC*	CAC*
Dissolved Metals																															
Ground Water	MB-1	430.0	118.0	32.6	0.40	U	20	4	0.4	W	6734	883	0.8	W	70	41	1.3	W	523	20	1.6	J	4671	542	0.50	W	50	3.1	U	403	386
	MB-2	442.3	128.0	29.1	0.40	U	21	4	0.4	W	6986	899	0.8	U	72	42	1.3	W	542	21	1.6	J	4988	555	0.50	W	52	5.1	U	412	374
	MB-5	384.5	94.4	28.8	0.40	U	18	3	0.4	W	4896	584	0.8	W	58	36	1.3	W	409	16	2.2	J	4138	490	0.50	W	36	7.0	U	342	310
	MB-6	410.2	117.0	28.6	0.40	U	19	3	0.4	W	6617	858	0.8	W	67	39	1.3	W	492	19	10.8	J	4661	520	0.50	W	46	6.1	U	387	350
	MB-7	379.0	98.1	32.5	0.40	U	18	3	0.4	W	5171	616	0.8	U	62	37	1.3	W	448	17	0.7	J	4378	497	0.50	W	40	5.1	U	362	328
	MB-8	701.3	137.0	87.2	0.40	U	36	5	8.0		9980	1020	18.9		111	62	30.3		975	36	11.5	J	7369	619	0.50	W	116	80.8		610	562
	MB-9	229.4	57.7	20.7	0.40	U	10	2	0.4	W	3428	409	0.8	W	39	24	1.3	W	236	9	0.8	W	2863	316	0.50	W	17	3.1	U	237	214
	MB-10	418.7	111.0	34.3	0.40	U	20	3	0.4	W	6810	869	0.8	W	68	40	1.3	W	505	20	0.8	W	4763	529	0.50	W	48	6.4	U	364	367
	Duplicate +	422.5	118.0	32.2	0.40	U	20	4	0.4	W	5662	674	0.8	U	66	41	1.3	W	511	20	1.5	J	4800	534	0.50	W	46	11.8	U	387	358
Pond Water	*On-site (S)*	*213.1*	*55.7*	*30.1*	*0.20*	U	9	2	0.8	U	3227	386	0.8	U	36	23	0.7	U	214	8	1.9	U	2660	299	0.70	U	18	0.7	W	222	201
Surface Water	SW-1	364.1	85.4	36.6	0.20	U	17	3	10.0	U	5004	596	2.9	J	60	36	0.7	U	423	16	2.9	J	4232	470	0.70	U	37	0.7	W	360	317
	Duplicate++	362.4	85.2	36.3	0.20	U	17	3	0.80	U	4965	594	1.5	J	60	36	0.7	U	420	16	2.1	J	4216	469	0.70	U	37	20.0	U	348	316
	SW-6	355.3	84.0	36.3	0.20	U	16	3	0.78	J	4804	586	1.3	J	59	36	0.7	U	410	16	1.1	J	4145	461	0.70	U	36	2.8	J	343	310
	SW-8	423.8	96.9	42.9	0.20	U	20	4	0.80	U	5667	676	1.1	J	69	41	0.7	U	513	20	0.8	U	4812	536	0.70	U	49	0.7	W	396	360

Notes:
* - Values calculated according to the Indiana Register (1990) (327 IAC 2).
** - Sample concentrations are ug/L (ppb)
AAC - Acute Aquatic Criteria
CAC - Chronic Aquatic Criteria
+ - Duplicate sample collected from monitoring well MB-1.
++ - Duplicate sample collected from surface water sampling location SW-1.
(1) No CAC is calculated for silver.

TABLE 12: SAMPLING LOCATIONS EXCEEDING APPLICABLE WATER QUALITY CRITERIA, SPETEMBER 2002

Parameter	Matrix	Sample Location	Monitoring Well Zone (1)	Sample Concentration (ug/L)	Criterion Exceeded	Criterion Concentration (ug/L)	Source	Average (1) Concentration Of Zone (ug/L)	Exceeds Criterion	Concentration After Mixing (ug /L) (2)	Exceeds Criterion
TCL Volatiles (ug/L)											
Trichloroethane	Groundwater	MB-1	I	56	MCL	5	E	31	Yes	0.02	No
Trichloroethane	Groundwater	Duplicate	I	65	MCL	5	E	35	Yes	0.02	No
Dissolved TAL Metals											
Arsenic	Groundwater	MB-1	I	9.0	HH	0.175	I	48.3	Yes	0.03	No
Arsenic	Groundwater	MB-2	I	87.6	HH	0.175	I	48.3	Yes	0.03	No
Arsenic	Groundwater	MB-5	II	23.7	HH	0.175	I	73.9	Yes	0.04	No
Arsenic	Groundwater	MB-6	II	124	HH	0.175	I	73.9	Yes	0.04	No
Arsenic	Groundwater	MB-7	III	74.8	HH	0.175	I	104.9	Yes	0.06	No
Arsenic	Groundwater	MB-8	III	135	HH	0.175	I	104.9	Yes	0.06	No
Arsenic	Groundwater	MB-9	NA	10.4	HH	0.175	I	--	--	--	--
Arsenic	Groundwater	Duplicate	I	8.2	HH	0.175	I	48.3	Yes	0.03	No
Arsenic	Groundwater	MB-2	I	87.6	MCL	50	E	48.3	No	0.03	No
Arsenic	Groundwater	MB-6	II	124	MCL	50	E	73.9	Yes	0.04	No
Arsenic	Groundwater	MB-7	III	74.8	MCL	50	E	104.9	Yes	0.06	No
Arsenic	Groundwater	MB-8	III	135	MCL	50	E	104.9	Yes	0.06	No
Iron	Groundwater	MB-1	I	1520	AAC	1000	E	10560	Yes	6	No
Iron	Groundwater	MB-2	I	19600	AAC	1000	E	10560	Yes	6	No
Iron	Groundwater	MB-5	II	7900	AAC	1000	E	12000	Yes	7	No
Iron	Groundwater	MB-6	II	16100	AAC	1000	E	12000	Yes	7	No
Iron	Groundwater	MB-7	III	11000	AAC	1000	E	14600	Yes	8	No
Iron	Groundwater	MB-8	III	18200	AAC	1000	E	14600	Yes	8	No
Iron	Groundwater	MB-9	NA	2080	AAC	1000	E	--	--	--	--
Iron	Groundwater	Duplicate	I	1510	AAC	1000	E	10560	Yes	6	No
Indicator Parameters				(mg/L)		(mg/L)		(mg/L)		(mg/L)	
Unionized	Groundwater	MB-2	I	0.0187	CAC	0.0029	E	0.0095	Yes	0.000005	No
Ammonia (mg/L)	Groundwater	MB-5	II	0.0163	CAC	0.0029	E	0.0132	Yes	0.000007	No
	Groundwater	MB-6	II	0.0100	CAC	0.0029	E	0.0132	Yes	0.000007	No
	Groundwater	MB-7	III	0.0213	CAC	0.0029	E	0.0217	Yes	0.000012	No
	Groundwater	MB-8	III	0.0220	CAC	0.0029	E	0.0217	Yes	0.000012	No
	Groundwater	MB-9	NA	0.0089	CAC	0.0029	E	--	--	--	--

Notes:

AAC - Acute Aquatic Criteria
CAC - Chronic Aquatic Criteria
Duplicate - Duplicate sample collected from monitoring well MB-1
NA - Not applicable; sampling location is not included in the monitoring zone calculations.
HH - Human Health Criteria
MCL - Maximum Contaminant Level

(1) Refer to the Environmental Resources Management (ERM) Remedial Action Plan for Marion (Bragg) Landfill Site, Marion, Indiana, dated 1989, for definition of monitoring well zones and concentration calculations. Monitoring well zone I will consist of MB-1 and MB-2 with condensed monitoring program, since MB-3 and MB-4 have been removed from the sampling program.

(2) Refer to the Camp, Dresser, and McKee (CDM) Remedial Investigation Report, dated 1987, for mixing zone calculations.

APPENDIX A

Chain-of-Custody Forms

CHAIN-OF-CUSTODY RECORD

No. U6471

CompuChem
a division of Liberty Analytical Corp.
501 Madison Avenue
Cary, NC 27513
1-800-833-5097

Project Name: Marion Bragg	Client Address: C&M Inc 323 N Indiana St Bronville IN 46122	Point-of-Contact: Pete Burton
Carrier: FedEx		Telephone No.: 3177183688
Airbill No.: 822536077079		Sampling complete? (Y) or N (see Note 1)
Sampler Name: Pete Burton	Sampler Signature: WPB	Project-specific (PS) or Batch (B) QC ?

BOX #1: 1. Surface Water; 2. Ground Water; 3. Leachate; 4. Rinsate; 5. Soil / Sediment / Sludge; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other bulk

BOX #2: A. HCl + Ice; B. HNO3 + Ice; C. NaOH + Ice; D. H2SO4 + Ice; E. Unpreserved; F. Ice Only; G. Other_____; H. NaHSO4 + Ice; I. ZnAc+NaOH + Ice; 3: B+D+F, D+B+D+E

BOX #3: F. Filtered; U. Unfiltered; B-Both

Box #4: H. High; M. Medium; L. Low

Box #5: C. CLP 3/90; S. SW-846; W. CWA 600-series; O. Other_____; T. TCLP

Sample ID (9 characters maximum)	Date: Year: 2002	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	COD	NH_3-N	TSS/Cl	Remarks / Comments (see Notes 2 & 3)
GWO5PB	9/18	10:00	2	N	B	L	S	6			X				X				X	X	X	VOC - HCl + Ice
GWO6PB	/	10:30	/	Z	B	/	/	6			/				/				/	/	/	BNA - Ice
GWO7PB	/	11:45	/	X	B	/	/	9		X	/				/				/	/	/	metals - HNO3 + Ice
GWO8PB	/	1230	/	X	B	/	/	9		X	/				/				/	/	/	COD - H2SO4 + Ice
GWO8DPPB	/	:	/	/	/	/	/	/		/	/				/				/	/	/	NH_3-N - H2SO4 + Ice
GWO8MSPB	/	:	/	/	/	/	/	/		/	/				/				/	/	/	TSS/Cl - Ice
GWO8MSDPB	/	:	/	/	/	/	/	/		/	/				/				/	/	/	
SWO4TBPB	/	1400	6	A	U			3		X												
GWICTBPB	/	1405	6	A	U			3		X												
* GWO9FBPB	/	1410	9	X	U	/	/	9		X	X				X				X	X	X	metals need Preserved in lab *

Clients Special Instructions: pls record temp of coolers & pH of samples on COC upon receipt

Temperature _____ °C

Lab: Received in Good Condition? Y or N Describe Problems, If any:

#1 Relinquished By: (Sig) WPB	Date: 9/18/02	#2 Relinquished By: (Sig)	Date:	#3 Relinquished By: (Sig)	Date:
Company Name: C&M Inc	Time: 1800	Company Name:	Time:	Company Name:	Time:
#1 Received By: (Sig)	Date:	#2 Received By: (Sig)	Date:	#3 Received By: (Sig)	Date:
Company Name:	Time:	Company Name:	Time:	Company Name:	Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

CompuChem
a division of Liberty Analytical Corp.
501 Madison Avenue
Cary, NC 27513
1-800-833-5097

CHAIN-OF-CUSTODY RECORD

No. U61476

Project Name: Marion Bragg	Client Address: O&M Inc	Point-of-Contact: P. Britton	
	303 N. Indiana St		
Carrier: Fed Ex	Danville IN 46122	Telephone No.: 3177183688	
Airbill No.: 825360779079		Sampling complete? (Y) or N (see Note 1)	
Sampler Name: Pete Britton	Sampler Signature: W.P.B.	Project-specific (PS) or Batch (B) QC ?	

BOX #1	BOX #2	BOX #3	Box #4	Box #6
1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil / Sediment / Sludge 6. Trip Blank 7. Oil 8. Waste 9. Other______	A. HCl + Ice B. HNO3 + Ice C. NaOH + Ice D. H2SO4 + Ice E. Unpreserved F. Ice Only G. Other______ H. NaHSO4 + Ice I. ZnAc+NaOH + Ice Z = ~~A~~ B + D + F (wpB 9/18/02)	F. Filtered U. Unfiltered B - Both	H. High M. Medium L. Low	C. CLP 3/90 S. SW-846 W. CWA 600-series O. Other______ T. TCLP

Sample ID (9 characters maximum)	Date: Year: 2002	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #6 Method (wpB 9/18/02)	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	COD	NH3	TSS/Cl		Remarks / Comments (see Notes 2 & 3)
SW02PB	9/17	1500	1	Z	B	L	CTS	6			X				X				X	X	X		BNA - ICE
SW03PB	↓	1505	↓	↓	↓	↓	↓	↓			↓				↓				↓	↓	↓		Metals - HNO_3 + Ice
SW01PB	↓	1615	↓	↓	↓	↓	↓	9		X	↓				↓				↓	↓	↓		COD - H_2SO_4 + Ice
SW01DPPB	↓	↓	↓	↓	↓	↓	↓	↓ (wpB 9/18/02)		↓	↓				↓				↓	↓	↓		NH_3N - H_2SO_4 + Ice
SW01MSPB	↓	↓	↓	↓	↓	↓	↓	↓		↓	↓				↓				↓	↓	↓		TSS/Cl - Ice
SW01MSDPB	↓	↓	↓	↓	↓	↓	↓	↓		↓	↓				↓				↓	↓	↓		
GW01PB	9/18	0740	2	↓	↓	↓	↓	6			↓				↓				↓	↓	↓		
GW02PB	↓	0815	↓	↓	↓	↓	↓	↓			↓				↓				↓	↓	↓		
GW03PB	↓	0850	↓	↓	↓	↓	↓	↓			↓				↓				↓	↓	↓		
GW04PB	↓	0930	↓	↓	↓	↓	↓	↓			↓				↓				↓	↓	↓		

Clients Special Instructions: Pls record temp of coolers & pH of samples on COC upon receipt @ lab   Temperature ______ °C

Lab: Received in Good Condition? Y or N   Describe Problems, if any:

#1 Relinquished By: (Sig) W.P.B.	Date: 9/18/02	#2 Relinquished By: (Sig)	Date:	#3 Relinquished By: (Sig)	Date:
Company Name: O&M Inc	Time: 1800	Company Name:	Time:	Company Name:	Time:
#1 Received By: (Sig)	Date:	#2 Received By: (Sig)	Date:	#3 Received By: (Sig)	Date:
Company Name:	Time:	Company Name:	Time:	Company Name:	Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge.   Note (3): All lab copies of data destroyed after three years.

CompuChem
a division of Liberty Analytical Corp.
501 Madison Avenue
Cary, NC 27513
1-800-833-5097

CHAIN-OF-CUSTODY RECORD

No. 06195

Project Name : Maria Briggs	Client Address : CTM Inc 303 N. Indiana St Danville, IN 46122	Point-of-Contact : Pete Kurtz
Carrier : FedEx		Telephone No. : 317 718 3644
Airbill No. : 822536077076		Sampling complete? (Y) or N (see Note 1)
Sampler Name : Pete Kurtz	Sampler Signature : PK	Project-specific (PS) or Batch (B) QC ? _____

BOX #1 1. Surface Water; 2. Ground Water; 3. Leachate; 4. Rinsate; 5. Soil / Sediment / Sludge; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other_____

BOX #2 A. HCl + Ice; B. HNO3 + Ice; C. NaOH + Ice; D. H2SO4 + Ice; E. Unpreserved; F. Ice Only; G. Other_____; H. NaHSO4 + Ice; I. ZnAc+NaOH + Ice; Z = B+D+F

BOX #3 F. Filtered; U. Unfiltered; B - Both

Box #4 H. High; M. Medium; L. Low

Box #5 C. CLP 3/90; S. SW-846; W. CWA 600-series; O. Other_____; T. TCLP

Sample ID (9 characters maximum)	Date: Year 2000	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	COD	NH_3N	TSS/Cl	Remarks / Comments (see Notes 2 & 3)
PW01PB	9/17	1705	1	Z	B	L	S	6			X				X				X	X	X	VOC - HCl + ICe
	/	:																				TOC - ICe
	/	:																				Metals - HNO_3 + ICl
	/	:																				COD - H_2SO_4 + ICe
	/	:																				NH_3N - H_2SO_4 + ICe
	/	:																				TSS/Cl - ICe
	/	:																				
	/	:																				
	/	:																				
	/	:																				

Clients Special Instructions: Pls record temp of coolers and pH of samples on COC upon Receipt @ Lab. Temperature _____ °C

Lab: Received in Good Condition? Y or N **Describe Problems, If any:**

#1 Relinquished By: (Sig) PK	#2 Relinquished By: (Sig)	#3 Relinquished By: (Sig)
Date: 9/18/00	Date:	Date:
Company Name: CTM IN	Company Name:	Company Name:
Time: 1600	Time:	Time:
#1 Received By: (Sig)	#2 Received By: (Sig)	#3 Received By: (Sig)
Date:	Date:	Date:
Company Name:	Company Name:	Company Name:
Time:	Time:	Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge.
Note (3): All lab copies of data destroyed after three years.

COMPUCHEM a Divison of Liberty Analytical
COMMERCIAL RECEIVING LOG

Client: O&M	Rec'd Date: 9/19/02	PPS/RFA 484
Project: Marion Brass	Courier: Fed Ex	Lab Instructions
Quote: Q1067	Airbill No. 8253 6077 9099	[illegible] QC
Login No. RU1067		
Subcontract? Y / N CET		
TAT Verbal ____ Report ??		

Cooler Rec'd By:	L. Schiller
Sample Login By:	[illegible]
Temperature:	4.0-6.0
Cyanide Samples checked for sulfide & chlorine?	Y / (NA)
Phenol Samples checked for chlorine?	Y / (NA)
Received in Good Condition?	(Y) / N
If no, explain:	

Parameters: VOC, SVOC, metals, Ammonia, TSS Cl

CompuChem ID	Client ID	QC	Matrix	Date 2002	Military Time	VOC No. & Type	pH	SVOC No. & Type	pH	metals No. & Type	pH	Ammonia No. & Type	pH	TSS Cl No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH
RU1067-1	SW01PB	*	WA	09/17	15:00	3-40mL		2AL		3-500mL	<2	3-PL	<2	3-PL							
-2	SW01DPPB		↓	/	15:05	3-40mL		2-AL		1PL	<2	1 PL	<2	1 PL							
-3	SW02PB		↓	/	16:15	–		↓		↓	<2	↓	<2	↓							
-4	SW03PB		↓	/	16:15	–		↓		↓	<2	↓	<2	↓							
-5	SW04TBPB		↓	/	14:00	3-40mL		–		–		–		–							
-6	PW01PB		↓	/	17:05	[illegible]		2-AL		1-PL	<2	1-PL	<2	1-PL							

[illegible] 9/19/02

95A [illegible] 9/19/02

Container Type Abbreviations: 40mL(40mL vial) AL(Amber Liter) PL(Plastic Liter) 500P(500mL Plastic) 250P(250mL Plastic) OTHER____

COMPUCHEM
a division of Liberty Analytical Corp.
501 Madison Avenue, Cary, NC 27513
Phone: (919) 379-4000 Fax: 4050

Internal Log-In Chain-of-Custody Report
For Samples Received: 09/19/2002

Customer: O & M
Project: MARION BRAGG
Quote: Q1067

Project Manager: Rodney Raimonde
919-379-4018
rraimonde@compuchemlabs.com

Lab ID	Client Sample ID	Collect Date	Receive Date	Due Date	Hold Date	Matrix	Media	#	Analysis	Comments
RW1067-1	GW01PB	9/18/2002	9/19/2002	10/2/2002	#########	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					#########	Water	plastic liter	1	CHLORIDE	
					#########	Water	500ml plastic	1	METALS-DISS-ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/25/2002	Water	plastic liter	0	TSS	
RW1067-10	GW09FBPB	9/18/2002	9/19/2002	10/2/2002	#########	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**Please filter & preserve in house
					#########	Water	plastic liter	1	CHLORIDE	
					#########	Water	plastic liter	1	METALS-DISS-ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/25/2002	Water	plastic liter	0	TSS	
					9/29/2002	Water	40ml vial	3	VOA-OLM04.2-5ML	
RW1067-11	GW10TBPB	9/18/2002	9/19/2002	10/2/2002	9/29/2002	Water	40ml vial	3	VOA-OLM04.2-5ML	PPS 489**
RW1067-2	GW02PB	9/18/2002	9/19/2002	10/2/2002	#########	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					#########	Water	plastic liter	1	CHLORIDE	
					#########	Water	500ml plastic	1	METALS-DISS-ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/25/2002	Water	plastic liter	0	TSS	
RW1067-3	GW03PB	9/18/2002	9/19/2002	10/2/2002	#########	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					#########	Water	plastic liter	1	CHLORIDE	
					#########	Water	500ml plastic	1	METALS-DISS-ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/25/2002	Water	plastic liter	0	TSS	
RW1067-4	GW04PB	9/18/2002	9/19/2002	10/2/2002	#########	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					#########	Water	plastic liter	1	CHLORIDE	

					#########	Water	500ml plastic	1	METALS-DISS-ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/25/2002	Water	plastic liter	0	TSS	
RW1067-5	GW05PB	9/18/2002	9/19/2002	10/2/2002	#########	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					#########	Water	plastic liter	1	CHLORIDE	
					#########	Water	500ml plastic	1	METALS-DISS-ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/25/2002	Water	plastic liter	0	TSS	
RW1067-6	GW06PB	9/18/2002	9/19/2002	10/2/2002	#########	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					#########	Water	plastic liter	1	CHLORIDE	
					#########	Water	500ml plastic	1	METALS-DISS-ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/25/2002	Water	plastic liter	0	TSS	
RW1067-7	GW07PB	9/18/2002	9/19/2002	10/2/2002	#########	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					#########	Water	plastic liter	1	CHLORIDE	
					#########	Water	500ml plastic	1	METALS-DISS-ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/25/2002	Water	plastic liter	0	TSS	
					9/29/2002	Water	40ml vial	3	VOA-OLM04.2-5ML	
RW1067-8	GW08PB	9/18/2002	9/19/2002	10/2/2002	#########	Water	plastic liter	3	AMMONIA (AS N)	PPS 489**
					#########	Water	plastic liter	3	CHLORIDE	
					#########	Water	500ml plastic	3	METALS-DISS-ILM04.0	
					9/24/2002	Water	amber liter	6	SVOA-OLM04.2	
					9/25/2002	Water	plastic liter	0	TSS	
					9/29/2002	Water	40ml vial	9	VOA-OLM04.2-5ML	
RW1067-9	GW08DPPB	9/18/2002	9/19/2002	10/2/2002	#########	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					#########	Water	plastic liter	1	CHLORIDE	
					#########	Water	500ml plastic	1	METALS-DISS-ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/25/2002	Water	plastic liter	0	TSS	
					9/29/2002	Water	40ml vial	3	VOA-OLM04.2-5ML	

COMPUCHEM
a division of Liberty Analytical Corp.
501 Madison Avenue, Cary, NC 27513
Phone: (919) 379-4000 Fax: 4050

Internal Log-In Chain-of-Custody Report
For Samples Received: 09/19/2002

Customer: O & M
Project: MARION BRAGG
Quote: Q1067

Project Manager: Rodney Raimonde
919-379-4018
rraimonde@compuchemlabs.com

Lab ID	Client Sample ID	Collect Date	Receive Date	Due Date	Hold Date	Matrix	Media	#	Analysis	Comments
RU1067-1	SW01PB	9/17/2002	9/19/2002	10/2/2002	#########	Water	plastic liter	3	AMMONIA (AS N)	PPS 489**USE FOR QC
					#########	Water	plastic liter	3	CHLORIDE	
					#########	Water	500ml plastic	3	METALS-DISS-ILM04.0	
					9/24/2002	Water	amber liter	6	SVOA-OLM04.2	
					9/24/2002	Water	plastic liter	0	TSS	
					9/29/2002	Water	40ml vial	8	VOA-OLM04.2-5ML	
RU1067-2	SW01DPPB	9/17/2002	9/19/2002	10/2/2002	#########	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					#########	Water	plastic liter	1	CHLORIDE	
					#########	Water	500ml plastic	1	METALS-DISS-ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/24/2002	Water	plastic liter	0	TSS	
					9/29/2002	Water	40ml vial	3	VOA-OLM04.2-5ML	
RU1067-3	SW02PB	9/17/2002	9/19/2002	10/2/2002	#########	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					#########	Water	plastic liter	1	CHLORIDE	
					#########	Water	500ml plastic	1	METALS-DISS-ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/24/2002	Water	plastic liter	0	TSS	
RU1067-4	SW03PB	9/17/2002	9/19/2002	10/2/2002	#########	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					#########	Water	plastic liter	1	CHLORIDE	
					#########	Water	500ml plastic	1	METALS-DISS-ILM04.0	
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2	
					9/24/2002	Water	plastic liter	0	TSS	
RU1067-5	PW01PB	9/17/2002	9/19/2002	10/2/2002	#########	Water	plastic liter	1	AMMONIA (AS N)	PPS 489**
					#########	Water	plastic liter	1	CHLORIDE	

					#########	Water	500ml plastic	1	METALS-DISS-ILM04.0		
					9/24/2002	Water	amber liter	2	SVOA-OLM04.2		
					9/24/2002	Water	plastic liter	0	TSS		
RU1067-6	SW04TBPB	9/17/2002	9/19/2002	10/2/2002	9/29/2002	Water	40ml vial	3	VOA-OLM04.2-5ML	PPS 489**	

COMPUCHEM
a division of Liberty Analytical Corp.
501 Madison Avenue, Cary, NC 27513
Phone: (919) 379-4000 Fax: 4050

Internal Log-In Chain-of-Custody Report
For Samples Received: 09/19/2002

Customer: O & M
Project: MARION BRAGG
Quote: Q1067

Project Manager: Rodney Raimonde
919-379-4018
rraimonde@compuchemlabs.com

Lab ID	Client Sample ID	Collect Date	Receive Date	Due Date	Hold Date	Matrix	Media	#	Analysis	Comments
RV1067-1	SW02PB	9/17/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-10	GW06PB	9/18/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-11	GW07PB	9/18/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-12	GW08PB	9/18/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-13	GW08DPPB	9/18/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-14	GW09FBPB	9/18/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-15	PW01PB	9/17/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-2	SW03PB	9/17/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-3	SW01PB	9/17/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-4	SW01DPPB	9/17/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-5	GW01PB	9/18/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-6	GW02PB	9/18/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-7	GW03PB	9/18/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-8	GW04PB	9/18/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET
RV1067-9	GW05PB	9/18/2002	9/19/2002	10/2/2002		Water		0	SUBCONTRACT	SUB COD TO CET

COMPUCHEM

Login Chain of Custody Report (In01)

Sep. 19, 2002 *03:41 PM*

Login Number: RU1067

Account: O & M O & M

Project: MARION BRAGG

Case: Q1067

Laboratory Sample Number		Client Sample Number	Collect Date	Receive Date	PR	Due Date	Comments
RU1067-1		SW01PB	17-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**USE FOR QC
Water	S	AMMONIA (AS N)	Hold: 15-OCT-02	plastic liter	3	Bottles	
Water	S	CHLORIDE	Hold: 15-OCT-02	plastic liter	3	Bottles	
Water	S	METALS-DISS-ILM04.(	Hold: 15-OCT-02	500ml plastic	3	Bottles	
Water	S	SVOA-OLM04.2	Hold: 24-SEP-02	amber liter	6	Bottles	
Water	S	TSS	Hold: 24-SEP-02	plastic liter			
Water	S	VOA-OLM04.2-5ML	Hold: 29-SEP-02	40ml vial	8	Bottles	
RU1067-2		SW01DPPB	17-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	S	AMMONIA (AS N)	Hold: 15-OCT-02	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold: 15-OCT-02	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.(	Hold: 15-OCT-02	500ml plastic	1	Bottles	
Water	S	SVOA-OLM04.2	Hold: 24-SEP-02	amber liter	2	Bottles	
Water	S	TSS	Hold: 24-SEP-02	plastic liter			
Water	S	VOA-OLM04.2-5ML	Hold: 29-SEP-02	40ml vial	3	Bottles	
RU1067-3		SW02PB	17-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	S	AMMONIA (AS N)	Hold: 15-OCT-02	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold: 15-OCT-02	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.(	Hold: 15-OCT-02	500ml plastic	1	Bottles	
Water	S	SVOA-OLM04.2	Hold: 24-SEP-02	amber liter	2	Bottles	
Water	S	TSS	Hold: 24-SEP-02	plastic liter			
RU1067-4		SW03PB	17-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	S	AMMONIA (AS N)	Hold: 15-OCT-02	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold: 15-OCT-02	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.(	Hold: 15-OCT-02	500ml plastic	1	Bottles	
Water	S	SVOA-OLM04.2	Hold: 24-SEP-02	amber liter	2	Bottles	
Water	S	TSS	Hold: 24-SEP-02	plastic liter			
RU1067-5		PW01PB	17-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	S	AMMONIA (AS N)	Hold: 15-OCT-02	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold: 15-OCT-02	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.(	Hold: 15-OCT-02	500ml plastic	1	Bottles	
Water	S	SVOA-OLM04.2	Hold: 24-SEP-02	amber liter	2	Bottles	
Water	S	TSS	Hold: 24-SEP-02	plastic liter			
RU1067-6		SW04TBPB	17-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	S	VOA-OLM04.2-5ML	Hold: 29-SEP-02	40ml vial	3	Bottles	

Signature : _____

Date : 9/19/02

COMPUCHEM

Login Chain of Custody Report (ln01)

Sep. 19, 2002 *02:46 PM*

Login Number: RW1067

Account: O & M O & M

Project: MARION BRAGG

Case: Q1067

Laboratory Sample Number		Client Sample Number	Collect Date	Receive Date	PR	Due Date	Comments
RW1067-1		GW01PB	18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	S	AMMONIA (AS N)	Hold: 16-OCT-02	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold: 16-OCT-02	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.1	Hold: 16-OCT-02	500ml plastic	1	Bottles	
Water	S	SVOA-OLM04.2	Hold: 24-SEP-02	amber liter	2	Bottles	
Water	S	TSS	Hold: 25-SEP-02	plastic liter			
RW1067-2		GW02PB	18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	S	AMMONIA (AS N)	Hold: 16-OCT-02	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold: 16-OCT-02	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.1	Hold: 16-OCT-02	500ml plastic	1	Bottles	
Water	S	SVOA-OLM04.2	Hold: 24-SEP-02	amber liter	2	Bottles	
Water	S	TSS	Hold: 25-SEP-02	plastic liter			
RW1067-3		GW03PB	18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	S	AMMONIA (AS N)	Hold: 16-OCT-02	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold: 16-OCT-02	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.1	Hold: 16-OCT-02	500ml plastic	1	Bottles	
Water	S	SVOA-OLM04.2	Hold: 24-SEP-02	amber liter	2	Bottles	
Water	S	TSS	Hold: 25-SEP-02	plastic liter			
RW1067-4		GW04PB	18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	S	AMMONIA (AS N)	Hold: 16-OCT-02	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold: 16-OCT-02	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.1	Hold: 16-OCT-02	500ml plastic	1	Bottles	
Water	S	SVOA-OLM04.2	Hold: 24-SEP-02	amber liter	2	Bottles	
Water	S	TSS	Hold: 25-SEP-02	plastic liter			
RW1067-5		GW05PB	18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	S	AMMONIA (AS N)	Hold: 16-OCT-02	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold: 16-OCT-02	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.1	Hold: 16-OCT-02	500ml plastic	1	Bottles	
Water	S	SVOA-OLM04.2	Hold: 24-SEP-02	amber liter	2	Bottles	
Water	S	TSS	Hold: 25-SEP-02	plastic liter			
RW1067-6		GW06PB	18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water	S	AMMONIA (AS N)	Hold: 16-OCT-02	plastic liter	1	Bottles	
Water	S	CHLORIDE	Hold: 16-OCT-02	plastic liter	1	Bottles	
Water	S	METALS-DISS-ILM04.1	Hold: 16-OCT-02	500ml plastic	1	Bottles	
Water	S	SVOA-OLM04.2	Hold: 24-SEP-02	amber liter	2	Bottles	
Water	S	TSS	Hold: 25-SEP-02	plastic liter			

Signature : _____

Date : 9/15/02

97

COMPUCHEM

Login Chain of Custody Report (In01)

Sep. 19, 2002 *02:46 PM*

Login Number: RW1067

Account: O & M O & M

Project: MARION BRAGG

Q1067

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date	Comments
RW1067-7	GW07PB	18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water S AMMONIA (AS N)	Hold: 16-OCT-02	plastic liter	1	Bottles		
Water S CHLORIDE	Hold: 16-OCT-02	plastic liter	1	Bottles		
Water S METALS-DISS-ILM04.(	Hold: 16-OCT-02	500ml plastic	1	Bottles		
Water S SVOA-OLM04.2	Hold: 24-SEP-02	amber liter	2	Bottles		
Water S TSS	Hold: 25-SEP-02	plastic liter				
Water S VOA-OLM04.2-5ML	Hold: 29-SEP-02	40ml vial	3	Bottles		
RW1067-8	GW08PB	18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water S AMMONIA (AS N)	Hold: 16-OCT-02	plastic liter	1	Bottles		
Water S CHLORIDE	Hold: 16-OCT-02	plastic liter	1	Bottles		
Water S METALS-DISS-ILM04.(	Hold: 16-OCT-02	500ml plastic	1	Bottles		
Water S SVOA-OLM04.2	Hold: 24-SEP-02	amber liter	2	Bottles		
Water S TSS	Hold: 25-SEP-02	plastic liter				
Water S VOA-OLM04.2-5ML	Hold: 29-SEP-02	40ml vial	3	Bottles		
RW1067-9	GW08DPPB	18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water S AMMONIA (AS N)	Hold: 16-OCT-02	plastic liter	1	Bottles		
Water S CHLORIDE	Hold: 16-OCT-02	plastic liter	1	Bottles		
Water S METALS-DISS-ILM04.(	Hold: 16-OCT-02	500ml plastic	1	Bottles		
Water S SVOA-OLM04.2	Hold: 24-SEP-02	amber liter	2	Bottles		
Water S TSS	Hold: 25-SEP-02	plastic liter				
Water S VOA-OLM04.2-5ML	Hold: 29-SEP-02	40ml vial	3	Bottles		
RW1067-10	GW09FBPB	18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water S AMMONIA (AS N)	Hold: 16-OCT-02	plastic liter	1	Bottles		
Water S CHLORIDE	Hold: 16-OCT-02	plastic liter	1	Bottles		
Water S METALS-DISS-ILM04.(	Hold: 16-OCT-02	500ml plastic	1	Bottles		
Water S SVOA-OLM04.2	Hold: 24-SEP-02	amber liter	2	Bottles		
Water S TSS	Hold: 25-SEP-02	plastic liter				
Water S VOA-OLM04.2-5ML	Hold: 29-SEP-02	40ml vial	3	Bottles		
RW1067-11	GW10TBPB	18-SEP-02	19-SEP-02	9	02-OCT-02	PPS 489**
Water S VOA-OLM04.2-5ML	Hold: 29-SEP-02	40ml vial	3	Bottles		

Signature : _____

Date : 9/18/02

COMPUCHEM a... son ... ibe ... Ana ...

COMMERCIAL RECEIVING LOG

Client: O & M
Project: Marion Brass
Quote: CR1067
Login No. RW 1067
Subcontract? (Y) / N CES
TAT Verbal ______ Report 2013 [illegible] 9/19/02

Rec'd Date: 9/19/02
Courier: Fed Ex
Airbill No. 8253 6077 4099

PPS/RFA Fed 4/84

Lab Instructions
* use for QC

Cooler Rec'd By: E. Schill...
Sample Login By: [illegible]
Temperature: 4.0-6.5
Cyanide Samples checked for sulfide & chlorine? Y / (NA)
Phenol Samples checked for chlorine? Y / (NA)
Received in Good Condition? (Y) / N
If no, explain:

95 ARC 11/11/02

Parameters: VOC | SVOC | metals | Ammonia allammonia pH<2 [illegible] 9/19/02 | TSS CL

CompuChem ID	Client ID	QC	Matrix	Date 2002	Military Time	VOC No. & Type	pH	SVOC No. & Type	pH	metals No. & Type	pH	Ammonia No. & Type	pH	TSS CL No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH
RW1067-1	GW01PB		WA	09/18	07:40	—		2-AL		1-500mL	<2	1-PL	<2	1-PL							
2	GW02PB		↓	/	08:15	—					<2		<2								
3	GW03PB			/	08:50	—					<2		<2								
4	GW04PB			/	09:30	—					<2		<2								
5	GW05PB			/	10:00	—					<2		<2								
6	GW06PB			/	10:30	—					<2		<2								
7	GW07PB			/	11:45	3-40mL		↓		↓	<2	↓	<2	↓							
8	GW08PB	*		/	12:30	9-40mL		6-AL		3-500mL	<2	3 PL	<2	3 PL							
9	GW08DPPB			/	12:36	3-40mL		2 AL		1 500mL	<2	1 PL	<2	1 PL							
10	GW09FBPB			/	14:10	↓		↓		[illegible]	<2	↓	<2	↓							
11	GW10TBPB		↓	↓	14:05	↓		—		—		—		—							

[illegible] 9/19/02

Container Type Abbreviations: 40mL(40mL vial) AL(Amber Liter) PL(Plastic Liter) 500P(500mL Plastic) 250P(250mL Plastic) OTHER ______

6/28/01 dce

Internal Chain of Custody

RAW SAMPLE

Laboratory: Wetchem Matrix: H_2C

Request Date: 9/23/02

Comments:

	CCN	Receipt Date	Analysis Parameter	Preservative (FOR ALL)	Bottle Number (receiving use only)
1	RW1067-1	9/19/02	TSS		1 of 1
2	RW1067-2	9/19/02	TSS		1 of 1
3	RW1067-3	9/19/02	TSS		1 of 1
4	RW1067-4	9/19/02	TSS		1 of 1
5	RW1067-5	9/19/02	TSS		1 of 1
6	RW1067-6	9/19/02	TSS		1 of 1
7	RW1067-7	9/19/02	TSS		1 of 1
8	RW1067-8	9/19/02	TSS		3 of 3
9	RW1067-9	9/19/02	TSS		1 of 1
10	RW1067-10	9/19/02	TSS		1 of 1
11					of
12					of
13					of
14					of
15					of
16					of
17					of
18					of
19					of
20					of

* DENOTES ENTIRE SAMPLE USED AND BOTTLE DISPOSED OF.

Relinquished By: Michael Johnson Date: 9-23-02

Received By: Joseph Mohr Date: 9-23-02

Relinquished By: Joseph Mohr Date: 9-23-02

Received By: Cooler #1 Date: 9-23-02

Relinquished By: _____ Date: _____

Received By: _____ Date: _____

Internal Chain of Custody

RAW SAMPLE

Laboratory: Wetchem

Matrix: H_2O

Request Date: 9/26/02

Comments:

	CCN	Receipt Date	Analysis Parameter	Preservative (FOR ALL)	Bottle Number (receiving use only)
1	RW1067-1	9/19/02	AMMONIA (AS N)	H_2SO_4	1 of 1
2	RW1067-2	9/19/02	AMMONIA (AS N)		of
3	RW1067-3	9/19/02	AMMONIA (AS N)		of
4	RW1067-4	9/19/02	AMMONIA (AS N)		of
5	RW1067-5	9/19/02	AMMONIA (AS N)		of
6	RW1067-6	9/19/02	AMMONIA (AS N)		of
7	RW1067-7	9/19/02	AMMONIA (AS N)		of
8	RW1067-8	9/19/02	AMMONIA (AS N)		2 of 3
9	RW1067-9	9/19/02	AMMONIA (AS N)		1 of 1
10	RW1067-10	9/19/02	AMMONIA (AS N)		of
11					of
12					of
13					of
14					of
15					of
16					of
17					of
18					of
19					of
20					of

Relinquished By: E. Schedler Date: 9/26/02

Received By: [signature] Date: 9-26-02

Relinquished By: [signature] Date: 9-27-02

Received By: cooler #1 Date: 9-27-02

Relinquished By: _____ Date: _____

Received By: _____ Date: _____

Internal Chain of Custody

RAW SAMPLE

Laboratory: Wetchem

Matrix: H_2O

Request Date: 9/24/02

Comments:

		CCN	Receipt Date	Analysis Parameter	Preservative (FOR ALL)	Bottle Number (receiving use only)
✓	1	RW1067-1	9/19/02	CHLORIDE	NONE	1 of 1
✓	2	RW1067-2	9/19/02	CHLORIDE		1 of 1
✓	3	RW1067-3	9/19/02	CHLORIDE		1 of 1
✓	4	RW1067-4	9/19/02	CHLORIDE		1 of 1
✓	5	RW1067-5	9/19/02	CHLORIDE		1 of 1
✓	6	RW1067-6	9/19/02	CHLORIDE		1 of 1
✓	7	RW1067-7	9/19/02	CHLORIDE		1 of 1
✓	8	RW1067-8	9/19/02	CHLORIDE		3 of 3
✓	9	RW1067-9	9/19/02	CHLORIDE		1 of 1
mtx	10	RW1067-10	9/19/02	CHLORIDE		of
	11					of
	12					of
	13					of
	14					of
	15					of
	16					of
	17					of
	18					of
	19					of
	20					of

Pl. Liter

Relinquished By: Michael Johnson Date: 9-24-02

Received By: [signature] Date: 9-24-02

Relinquished By: [signature] Date: 9-27-02

Received By: Wolf #1 Date: 9-27-02

Relinquished By: _____ Date: _____

Received By: _____ Date: _____

S 11292

SUBCONTRACT CHAIN-OF-CUSTODY RECORD

COMPUCHEM
a division of Liberty Analytical Corp.

501 Madison Avenue
Cary, NC 27513
1-800-833-5097

Project Name: Marion Barge	Samples shipped to: CET	CompuChem point-of-contact: (4) Darrell Byrd
TAT: 13 day	Contact:	Phone: (919) 379-4100 X 4009
Report style: Full data Package	Address:	Fax: (919) 379-4050
Disk requirement:	Phone: ( )	Sampling complete? (Y) or N (see Note 1)
	Project Locale (state)	Project-specific (PS) or Batch (B) QC?

BOX #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil / Sediment / Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

BOX #2
A. HCl + Ice
B. HNO_3 + Ice
C. NaOH + Ice
D. H_2SO_4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. $NaHSO_4$ + Ice
I. ZnAc+NaOH + Ice
J. Methanol

BOX #3
F- Filtered
U- Unfiltered

BOX #4
H- High
M- Medium
L- Low

BOX #5
C- CLP
T- TCLP
S- SW-846
W- CWA 600-series
O- Other _____

Sample ID	Date / Year 02	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	# of Bottles	Use for Lab QC (MS or DUP)	PARAMETERS	CCN	Remarks / Comments (see Notes 2 & 3)
SW02PB	9/19	15:00	2					1		✓	RV1067-11	200682
03PB		15:05	2					1		✓	12	683
01PB		16:15	2					3	*	✓	13	84
01DPPB		16:15	2					3	*	✓	14	85
PW01PB	9/17	17:05	2					3	9/19/02	✓	15	86

Clients Special Instructions:

Temperature 5 °C

Lab: Received in good condition? Y or N Describe any problems:

#1 Relinquished by:(sig) [signature] Date: 9/20/02	#2 Relinquished by:(sig) [signature] Date: 9/19	Relinquished by:(sig) Date:
Company Name: CompuChem Time: 1550	Company Name: CET Time: 1705	Company Name: Time:
#1 Received by:(sig) [signature] Date: 9/19	#2 Received by:(sig) [signature] Date: 9/19/02	#2 Received by:(sig) Date:
Company Name: CET Time: 350	Company Name: CET Time: 1605	Company Name: Time:

Note (1) If "N" lab should batch samples to await remainder of project - maximizing batch size and minimizing QC ratio; if "Y" lab should begin processing batches now.
Note (2) Samples should be stored 60 days after date report mailed at no extra charge.
Note (3) All lab copies of data should be retained for a minimum of 3 years.
Note (4) Please call point-of-contact to verify receipt of samples.

Revision 0 2-10-99

S 11291

SUBCONTRACT CHAIN-OF-CUSTODY RECORD

COMPUCHEM
a division of Liberty Analytical Corp.

501 Madison Avenue
Cary, NC 27513
1-800-833-5097

Project Name: Marion Bragg
TAT: 13 day
Report style: Full data Package
Disk requirement:

Samples shipped to: CET
Contact:
Address:
Phone: ( )
Project Locale (state)

CompuChem point-of-contact: (4) Diane Byrd
Phone: (919) 379-4100 X 4009
Fax: (919) 379-4080
Sampling complete? (Y) or N (see Note 1)
Project-specific (PS) or Batch (B) QC? _____

BOX #1 (2) Surface Water, (3) Ground Water, 3. Leachate, 4. Rinsate, 5. Soil / Sediment / Sludge, 6. Trip Blank, 7. Oil, 8. Waste, 9. Other _____

BOX #2 A. HCl + Ice; B. HNO_3 + Ice; C. NaOH + Ice; D. H_2SO_4 + Ice; E. Unpreserved; F. Ice Only; G. Other _____; H. $NaHSO_4$ + Ice; I. ZnAc+NaOH + Ice; J. Methanol

BOX #3 F- Filtered; U- Unfiltered

BOX #4 H- High; M- Medium; L- Low

BOX #5 C- CLP; S- SW-846; W- CWA 600-series; O- Other _____; T- TCLP

Sample ID	Date / Year 02	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	# of Bottles	Use for Lab QC (MS or DUP)	PARAMETERS: COD	CCN	Remarks / Comments (see Notes 2 & 3)
GW05PB	9/18	10:00	WA	D				1		✓	RV1067-1	200 672
06PB		10:30						1		✓	-2	73
07PB		11:45						1		✓	3	74
08PB		12:30						3	*	✓	4	75
08DPPB		12:30						1		✓	5	76
09FBPB	↓	14:10	↓	↓				1		✓	6	77
01PB	9/18	09:40						1		✓	7	78
02PB		08:15						1		✓	8	79
03PB		0850						1		✓	9	80
04PB	↓	09:30	↓	↓				1		✓	↓ 10	81

Clients Special Instructions:

Temperature 5 °C

Lab: Received in good condition? Y or N Describe any problems:

#1 Relinquished by:(sig)	Date: 9/19/02	#2 Relinquished by:(sig)	Date: 9/19	Relinquished by:(sig)	Date:
Company Name: CompuChem	Time: 1550	Company Name: CET	Time: 405	Company Name:	Time:
#1 Received by:(sig)	Date: 9/19	#2 Received by:(sig)	Date: 9.19.02	#2 Received by:(sig)	Date:
Company Name: CET	Time: 330	Company Name: CET	Time: 1605	Company Name:	Time:

Note (1) If "N" lab should batch samples to await remainder of project - maximizing batch size and minimizing QC ratio; if "Y" lab should begin processing batches now.
Note (2) Samples should be stored 60 days after date report mailed at no extra charge.
Note (3) All lab copies of data should be retained for a minimum of 3 years.
Note (4) Please call point-of-contact to verify receipt of samples.

Revision 0 2-10-99

COMPUCHEM
a division of Liberty Analytical Corp.
501 Madison Avenue
Cary, NC 27513
1-800-833-5097

CHAIN-OF-CUSTODY RECORD

No. J614,3

Project Name: Marion Bragg	Client Address: O4M Inc 303 N. Indiana St Danville IN 46122	Point-of-Contact: P. Burton
Carrier: Fed Ex		Telephone No.: 3177183688
Airbill No.: 825360779079		Sampling complete? (Y) or N (see Note 1)
Sampler Name: Pete Burton	Sampler Signature: W P[illegible]	Project-specific (PS) or Batch (B) QC ?

BOX #1	BOX #2	BOX #3	Box #4	Box #5
1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil / Sediment / Sludge 6. Trip Blank 7. Oil 8. Waste 9. Other	A. HCl + Ice B. HNO3 + Ice C. NaOH + Ice D. H2SO4 + Ice E. Unpreserved F. Ice Only G. Other H. NaHSO4 + Ice I. ZnAc+NaOH + Ice 2 = A B+D+F	F. Filtered U. Unfiltered B - Both	H. High M. Medium L. Low	C. CLP 3/90 S. SW-846 W. CWA 600-series O. Other T. TCLP

Sample ID (9 characters maximum)	Date: Year: 2002	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	COD	NH3N	TSS/Cl	Remarks / Comments (see Notes 2 & 3)
SW02PB	9/17	1500	1	2	B	L	ETS	6			X				X				X	X	X	BNA - Ice
SW03PB	9/17	15:05	1	2	B	L	ETS	6			X				X				X	X	X	metals - HNO_3 + Ice
*SW01PB	9/17	16:15	1	2	B	L	ETS	6			X				X				X	X	X	COD - H_2SO_4 + Ice
SW01DPPB	9/17	16:15	1	2	B	L	ETS	6			X				X				X	X	X	NH_3N - H_2SO_4 + Ice
SW01MSPB	9/17	16:15	1	2	B	L	ETS	6			X				X				X	X	X	TSS/Cl - Ice
SW01MSDPB	9/17	16:15	1	2	B	L	ETS	6			X				X				X	X	X	*SW01PB 1 liter vial broken upon receipt @ 9/19/02
GW01PB	9/18	07:40	2	2	B	L	ETS	6			X				X				X	X	X	
GW02PB	9/18	0815	2	2	B	L	ETS	6			X				X				X	X	X	PW01PB Not listed
GW03PB	9/18	0850	2	2	B	L	ETS	6			X				X				X	X	X	on COC for all samples
GW04PB	9/18	0930	2	2	B	L	ETS	6			X				X				X	X	X	@ 9/19/02

Clients Special Instructions: Pls record temp of coolers & pH of samples on COC upon receipt @ lab — Temperature 4.0-6.0 °C

Lab: Received in Good Condition? Y or N — Describe Problems, If any:

#1 Relinquished By: (Sig) W. P[illegible]	Date: 9/18/02	#2 Relinquished By: (Sig) — Date:	#3 Relinquished By: (Sig) — Date:
Company Name: O4M Inc	Time: 1800	Company Name: — Time:	Company Name: — Time:
#1 Received By: (Sig) E. [illegible]	Date: 9/19/02	#2 Received By: (Sig) — Date:	#3 Received By: (Sig) — Date:
Company Name: CompuChem	Time: 0900	Company Name: — Time:	Company Name: — Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

CompuChem
a division of Liberty Analytical Corp.
501 Madison Avenue
Cary, NC 27513
1-800-833-5097

CHAIN-OF-CUSTODY RECORD

No. 00140

Project Name: Marion Bragg	Client Address: C&M Inc. 303 N. Indiana St Danville IN 46122	Point-of-Contact: P. Bolton
Carrier: Fed Ex		Telephone No.: 317 718 3660
Airbill No.: 825360779079		Sampling complete? (Y) or N (see Note 1)
Sampler Name: Pete Bolton	Sampler Signature: [signature]	Project-specific (PS) or Batch (B) QC? ____

BOX #1: 1. Surface Water; 2. Ground Water; 3. Leachate; 4. Rinsate; 5. Soil / Sediment / Sludge; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other____

BOX #2: A. HCl + Ice; B. HNO3 + Ice; C. NaOH + Ice; D. H2SO4 + Ice; E. Unpreserved; F. Ice Only; G. Other____; H. NaHSO4 + Ice; I. ZnAc+NaOH + Ice; Z = A+B+D+F

BOX #3: F. Filtered; U. Unfiltered; B - Both

Box #4: H. High; M. Medium; L. Low

Box #5: C. CLP 3/90; S. SW-846; W. CWA 600-series; O. Other____; T. TCLP

Sample ID (9 characters maximum)	Date: Year: 2002	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	COD	NH_3N	TSS/Cl	Remarks / Comments (see Notes 2 & 3)
SW02PB	9/17	1500	1	Z	B	L	624/625	6			X				X				X	X	X	BNA - ICE
SW03PB	/	15:05	/	/	/	/	/	/			/				/				/	/	/	metals - HNO_3 + ICE
SW01PB	/	16:15	/	/	/	/	/	9		X	/				/				/	/	/	COD - H_2SO_4 + ICE
SW01DPPB	/	:	/	/	/	/	/	3		/	/				/				/	/	/	NH_3N - H_2SO_4 + ICE
SW01MSPB	/	:	/	/	/	/	/	3		/	/				/				/	/	/	TSS/Cl - ICE
SW01MSDPB	/	:	/	/	/	/	/	3		/	/				/				/	/	/	
GW01PB	9/18	07:40	2					3														
GW02PB	/	0815	/					/														
GW03PB	/	0850	/					/														
GW04PB	/	0930	/					/														

Clients Special Instructions: PS record temp of coolers & pH of samples on COC upon receipt @ lab — Temperature 4.0-6.8°C

Lab: Received in Good Condition? Y or N — Describe Problems, if any:

#1 Relinquished By: (Sig) W. Pete Bolton	Date: 9/18/02	#2 Relinquished By: (Sig) Date:	#3 Relinquished By: (Sig) Date:
Company Name: C&M Inc	Time: 1800	Company Name: Time:	Company Name: Time:
#1 Received By: (Sig) Jo Schellen	Date: 9/19/02	#2 Received By: (Sig) Date:	#3 Received By: (Sig) Date:
Company Name: CompuChem	Time: 0900	Company Name: Time:	Company Name: Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now
Note (2) Samples stored 60 days after date report mailed at no extra charge
Note (3): All lab copies of data destroyed after three years.

CHAIN-OF-CUSTODY RECORD

No. J04.1

CompuChem
a division of Liberty Analytical Corp.
501 Madison Avenue
Cary, NC 27513
1-800-833-5097

Project Name: Marion Bragg	Client Address: O&M Inc 303 N Indiana St Danville, IN 46122	Point-of-Contact: Pete Burton
Carrier: Fed Ex		Telephone No.: 3177183680
Airbill No.: 822536077907 9		Sampling complete? (Y) or N (see Note 1)
Sampler Name: Pete Burton	Sampler Signature: WP(BB)	Project-specific (PS) or Batch (B) QC ? ____

BOX #1: 1. Surface Water; 2. Ground Water; 3. Leachate; 4. Rinsate; 5. Soil / Sediment / Sludge; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other Fuld

BOX #2: A. HCl + Ice; B. HNO3 + Ice; C. NaOH + Ice; D. H2SO4 + Ice; E. Unpreserved; F. Ice Only; G. Other____; H. NaHSO4 + Ice; I. ZnAc+NaOH + Ice; 3: B+D+F; X: A+B+D+E

BOX #3: F. Filtered; U. Unfiltered; B-Both

Box #4: H. High; M. Medium; L. Low

Box #5: C. CLP 3/90; S. SW-846; W. CWA 600-series; O. Other____; T. TCLP

Sample ID (9 characters maximum)	Date: Year: 2002	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	COD	NH_3N	TSS/Cl	Remarks / Comments (see Notes 2 & 3)
GWO5PB	9/18	10:00	2	Z	B	L	5	6			X				X				X	X	X	VOC - HCl + ICe
GWO6PB	/	10:30	/	Z	B	/	/	6			/				/				/	/	/	BNA - ICe
GWO7PB	/	11:45	/	X	B	/	/	9		X	/				/				/	/	/	metals - HNO_3 + IC
GWO8PB	/	1230	/	X	B	/	/	9		X	/				/				/	/	/	COD - H_2SO_4 + ICe
GWO8DPPB	/	/	/	/	/	/	/	/		/	/				/				/	/	/	NH_3N - H_2SO_4 + ICe
GWO8MSPB	/	/	/	/	/	/	/	/		/	/				/				/	/	/	TSS/Cl - ICe
GWO8MSDPB	/	/	/	/	/	/	/	/		/	/				/				/	/	/	
SWO4TBPB	/	14:00	6	A	U			3		X												
GWO1OTBPB	/	14:05	6	A	U			3		X												
GWO9FBPB	/	1410	9	X	U	/	/	9		X	X				X				X	X	X	metals* need Preserved 12 hours @ lab

Clients Special Instructions: pls record temp of coolers & pH of samples on COC upon receipt Temperature 4.0°C

Lab: Received in Good Condition? Y or N Describe Problems, if any:

#1 Relinquished By: (Sig) WP(BB)	Date: 9/18/02	#2 Relinquished By: (Sig) Date:
Company Name: O&M Inc	Time: 1800	Company Name: Time:
#1 Received By: (Sig) E. Schiller	Date: 9/19/02	#2 Received By: (Sig) Date:
Company Name: CompuChem	Time: 0900	Company Name: Time:

#3 Relinquished By: (Sig)	Date:	
Company Name:	Time:	
#3 Received By: (Sig)	Date:	
Company Name:	Time:	

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; if "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

APPENDIX B

Trillium, Inc.

Data Validation Reports

TRILLIUM INC.

DATA VALIDATION

FOR

MARION BRAGG LANDFILL
MARION, INDIANA

ORGANIC ANALYSIS DATA
Volatiles in Water

SDG Nos. RU1067 and RW1067
September 2002 Sample Collections

Chemical Analyses Performed by:

CompuChem Environmental
Cary, North Carolina

FOR

O & M, Inc.
Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, Tennessee 37922
(865) 966-8880

November75, 2002

92241/CAE/DAS
\MARION\Sept02\voc

TRILLIUM INC.

EXECUTIVE SUMMARY

Validation of the volatile organics analysis data prepared by CompuChem Environmental for five water samples, one field blank, and two trip blanks from the Marion Bragg Landfill site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in two separate data packages, under Sample Delivery Group (SDG) Nos. RW1067 and RU1067, which were received for review on October 4, 2002. The following samples were reported:

SDG No. RW1067:

GW08PB (MB-1)	GW08DPPB (MB-1D)	GW07PB (MB-2)
GW09FBPB (field blank)	GW10TBPB (trip blank)	

SDG No. RU1067:

SW01PB (SW-1)	SW01DPPB (SW-1D)	SW04TBPB (trip blank)

Findings of the validation effort resulted in the following qualifications of reported sample results:

- Results for methylene chloride in all samples were qualified as less than the contract required quantitation limit and as estimated (10 UJ).
- Results for acetone in SW04TBPB and for chloromethane in GW09FBPB were qualified as estimated (J).
- Results for toluene in all samples were qualified as less than the contract required quantitation limit (10 U).
- The result for acetone in GW07PB was qualified as less than the contract required quantitation limit and as estimated (10 UJ).
- Results for trichloroethene and chlorobenzene in GW08PB were qualified as estimated (J, UJ).
- The result for carbon disulfide in SW01DPPB was qualified as not detected at the CRQL (10 U).
- The TIC peak at approximate RT 15.3 minutes in SW01PB, SW01DPPB, GW07PB, GW08PB, and GW10TBPB was rejected (R)
- The TIC peak reported at RT 14.3 minutes in SW01PB was rejected (R).

All "B" qualifiers, applied by the laboratory to indicate the presence of an analyte in the associated method blank, were removed by the validator. Laboratory-applied "J" qualifiers were not removed by the validator except where superceded by validator-applied qualifiers.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section XIV). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues observed in the data packages are discussed in Section XIII.

This validation report should be considered part of both data packages for all future distributions of the volatiles data.

INTRODUCTION

Analyses were performed according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis (OLM04.2). Results of sample analyses are reported by the laboratory as either qualified or unqualified; various qualifier codes are used to denote specific information regarding the analytical results.

Validation was performed in accordance with the USEPA "Contract Laboratory Program National Functional Guidelines for Organic Data Review" (EPA 540/R-99/008, 10/99). The EPA Region II Standard Operating Procedure HW-6 (Rev. 11), "Evaluation of Organics Data for the CLP," (6/96) was also considered during the evaluation and professional judgment was applied as necessary and appropriate.

The data validation process is intended to evaluate data on a technical basis rather than a contract compliance basis for chemical analyses conducted under the CLP. An initial assumption is that each data package is presented in accordance with the CLP requirements. It is also assumed that each data package represents the best efforts of the laboratory and has already been subjected to adequate and sufficient quality review prior to submission for validation.

During the validation process, laboratory data are verified against all available supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes in accordance with the National Functional Guidelines:

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

NJ - The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

These codes are recorded on the customized data tables in Attachment A and the laboratory's Organic Analysis Data Sheets (Form I, Attachment B) to qualify the results as appropriate according to the review of the data packages.

Two facts should be noted by all data users. First, **the "R" qualifier means that the laboratory-reported value is unusable.** In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, **no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable.** Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.

I. Holding Times, Preservation and Sample Integrity

The water samples and associated blanks were collected on 9/17-18/02. All sample analyses were performed on 9/25-26/02, which is within the specified holding time for chemically-preserved water samples. Acceptable pH values of 1 were determined by the laboratory at the time of analysis for each sample, confirming successful chemical preservation. Sample pHs were not documented directly on the chain of custody (COC) records, but were recorded on Water Batch Sheets provided in both data packages.

Acceptable cooler temperatures (4-6°C) on receipt at the laboratory were recorded on both COC records applicable to these samples. The same temperatures were also recorded on the laboratory's receiving logs in both data packages.

Sampler notations on each COC indicate that the samples for volatiles analysis were preserved with hydrochloric acid and iced. The narratives in both data packages further state that, with the exception of one broken 40-mL vial for SW01PB, all samples were received intact and properly refrigerated.

II. GC/MS Instrument Performance Checks

Four instrument performance checks using bromofluorobenzene (BFB) were run and reported, representing every shift (12-hour period) on both instruments during which samples or associated standards and quality control samples were analyzed. Results for all four performance checks were acceptable.

III. Calibration

Sample analyses were performed on a single gas chromatograph/mass spectrometer (GC/MS) system identified as HP73. 2-Butanone, 1,2-dichloropropane, and dibromochloromethane were manually integrated in one of the calibration standards run on this instrument in association with this data set. Each manual integration was correctly performed, properly documented and accurately incorporated into the applicable quantitation report. No system monitoring or internal standard peaks were manually integrated.

The laboratory's storage blank only was analyzed on a second GC/MS system identified as HP59. Bromomethane was manually integrated in two of the standards run on this instrument in association with this data set. Each manual integration was correctly performed, properly documented and accurately incorporated into the applicable quantitation report. No system monitoring or internal standard peaks were manually integrated.

A. Initial Calibration (IC)

Two ambient purge ICs (9/17/02 on HP73 and 9/27/02 on HP59) were associated with the reported sample and quality control analyses. Documentation of all individual IC standards run was present in both data packages and relative response factor (RRF) as well as percent relative standard deviation (%RSD) values were correctly calculated and accurately reported. All RRF values were above the minimum acceptance criterion (0.05) in both ICs. %RSD values were below the 30% maximum acceptance criterion except for methylene chloride (33.0%) in the IC on HP73 and bromomethane (39.8%) in the IC on HP59.

Results for methylene chloride in all samples in this data set were qualified as estimated (J) based on the high %RSD in the associated IC on HP73. No site samples were associated with the IC on HP59, therefore no qualifiers were necessary based on the high %RSD for bromomethane.

B. Continuing Calibration (CC)

Reported site sample and quality control analyses were performed under two CC standards, (9/25/02-08:16 and 9/26/02-08:18) on HP73. The storage blank was analyzed immediately following the IC on HP59, and no separate CC standard was analyzed. Instead, the mid-point IC standard was evaluated by the laboratory and the validator against the CC standard criteria, as required by CLP.

Documentation of both CC standards and the mid-point IC standard presented as a CC standard was present in the applicable data packages and RRF as well as percent difference (%D) values were correctly calculated and accurately reported. All RRFs were above the 0.05 minimum criterion. %D values were less than the maximum acceptance limit of 25% except for acetone (36.4%) and 2-butanone (25.2%) in the 9/25/02-08:16 CC on HP73; dichlorodifluoromethane (37.6%), chloromethane (28.1%), acetone (35.4%), and 2-butanone (25.4%) in the 9/26/02-08:18 CC on HP73, and bromomethane (28.1%) in the mid-point IC standard on HP59.

Results for acetone in SW04TBPB and GW07PB and for chloromethane in GW09FBPB were qualified as estimated (J) because they were detected in samples associated with the CC standards which had elevated %Ds for these compounds.

No other positive results were reported for the target analytes listed above in the samples associated with the affected CCs, the RRFs were all acceptable (i.e., were greater than 0.05) in the affected CC standards, and the %Ds were not substantially above the acceptance criterion (i.e., were not greater than 50%). Therefore, no additional qualifiers were applied based on the CC standard results.

IV. Blanks

Three laboratory method blanks (MBs: VBLKAE, VBLKCG, and VBLKYS) were analyzed with the samples in this data set. Methylene chloride (9 µg/L) and toluene (0.6 µg/L) were detected in VBLKAE; dichlorodifluoromethane (0.5 µg/L), methylene chloride (4 µg/L), and toluene (0.8 µg/L) were detected in VBLKCG; and acetone (3 µg/L), methylene chloride (2 µg/L), and toluene (1 µg/L) were detected in VBLKYS. Results for methylene chloride and toluene in all samples were qualified as less than the contract required quantitation limit (CRQL, 10 U) because the reported values were less than five times the concentration found in the associated method blank. The "B" qualifiers applied by the laboratory to these results to indicate that these compounds were also present in the associated method blank were removed by the validator.

Dichlorodifluoromethane was not detected in any of the site samples and only the laboratory's storage blank was associated with VBLKYS. Therefore, no additional qualifiers were required based on method blank contamination.

One storage blank (VHBLKVU) was also analyzed in association with the site samples. Methylene chloride (1 µg/L) and toluene (1 µg/L) were detected in VHBLKVU. Results for both of these compounds in all samples were previously qualified based on associated method blank contamination, and no additional action was taken based on storage blank contamination.

Two trip blanks (GW10TBPB and SW04TBPB) and one field blank (GW09FBPB) were included in this data set. After qualifications based on laboratory blank contamination, acetone (6 µg/L) was found in SW04TBPB and chloromethane (0.5 µg/L) and trichloroethene (0.9 µg/L) were found in GW09FBPB. Based on the available documentation, it is not possible to determine how the samples were organized into coolers for shipment to the laboratory, although it is apparent that at least two coolers were used. Therefore, for the purposes of this evaluation, both trip blanks were considered to be associated with all of the site samples, and the result for acetone in GW07PB was qualified as less than the CRQL (10 U) based on associated trip blank contamination.

Where detected in an associated sample, the concentration of trichloroethene was greater than five times the field blank concentration, and chloromethane was not reported in any of the samples associated with the field blank. Therefore, no additional sample results were qualified based on field-submitted blank contamination.

Tentatively identified compounds (TICs) found in all blanks associated with this data set are discussed in Section XI.

V. System Monitoring Compound Recoveries

Recoveries of the three system monitoring compounds (SMCs) in the reported results for all samples and blanks were correctly calculated, accurately reported and within the acceptance limits as documented on the summary forms.

VI. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Samples GW08PB and SW01PB were prepared and analyzed as MS/MSD pairs. Percent recoveries (%R) and relative percent differences (RPDs) between paired recoveries were correctly calculated and accurately reported for both sets of quality control data. The %Rs for all spiked target compounds were acceptable (94-106%) and reproducible (RPDs ≤4) in SW01PBMS/MSD. For GW08PBMS/MSD, recoveries for 1,1-dichloroethene, benzene, and toluene were acceptable (77-94%) and reproducible (RPDs ≤5), but recoveries for trichloroethene (66% and 52%; QC 71-120%) and chlorobenzene (66% and 64%; QC 75-130%) were unacceptably low. Chlorobenzene showed acceptable reproducibility (RPD 3), but the RPD for trichloroethene was high (24%; QC ≤14%).

In the unspiked analysis of GW08PB, chlorobenzene was not detected and trichloroethene was found at a concentration very close to the spike amount added (56 µg/L; 50 µg/L added). Accurate recovery should be achievable under these circumstances. Results for trichloroethene and chlorobenzene in GW08PB were qualified as estimated (J, UJ) on this basis.

A comparison of results for non-blank-related, unspiked target analytes in GW08PB, the MS, and the MSD was made. Agreement among the three results for vinyl chloride (13.9 %RSD) and cis-1,2-dichloroethene (13.3 %RSD) was acceptable. Carbon disulfide was detected at a low concentration (2 µg/L) in the MSD but was not found in the MS or in GW08PB, and 1,2-dichloroethane was found at low concentrations in the MS (0.5 µg/L) and in the MSD (1 µg/L) but was not found in GW08PB. Since the positive results were all less than the CRQL and neither analyte was reported by the laboratory in the unspiked sample, no action was taken based on these inconsistent results.

A comparison of results for non-blank-related, unspiked target analytes in SW01PB, the MS, and the MSD was also made. 1,2-Dichloroethane was found at low concentrations in the MS (0.8 µg/L) and in the MSD (1 µg/L) but was not found in SW01PB. Since the positive results were both less than the CRQL and this analyte was not reported by the laboratory in the unspiked sample, no action was taken based on these inconsistent results.

The presence of 1,2-dichloroethane in all four spiked analyses at concentrations ranging from 0.5 µg/L to 1 µg/L and its absence in both unspiked sample analyses suggests that the spiking solution may be contaminated. The laboratory should be requested to investigate this situation and implement any necessary corrective actions as soon as possible.

VII. Field Duplicate

Sample GW08DPPB was identified as a field duplicate of GW08PB. Agreement between paired results for vinyl chloride (0 RPD), cis-1,2-dichloroethene (0 RPD), and trichloroethene (14.9 RPD) was acceptable.

Sample SW01DPPB was identified as a field duplicate of SW01PB. Carbon disulfide was reported at a very low concentration in SW01DPPB (0.9 µg/L) but was not detected in in SW01DPPB (10 U). The result for carbon disulfide in SW01DPPB was qualified as not detected at the CRQL (10 U) due to lack of confirmation at a very low concentration in the field duplicate analysis.

VIII. Internal Standard (IS) Performance

All IS areas and retention times were within documented quality control limits for the reported sample analyses.

IX. Target Compound Identification

All reported target analytes were correctly identified with acceptable supporting mass spectra present in the applicable data packages.

X. Compound Quantitation and Reported Detection Limits

Target compound concentrations and CRQLs were correctly calculated and accurately reported. No dilutions were required for any of the samples. Some target analyte peaks were manually integrated in some of the samples in this data set. In each case, the manual integration was correctly performed, properly documented, and accurately incorporated into the applicable quantitation report.

"J" qualifiers were appropriately applied by the laboratory to the sample Form Is when the concentration of an analyte was less than the sample-specific quantitation limit. Except where superseded by another qualifier (e.g., "U" at the CRQL), these "J" qualifiers were not removed by the validator.

The data tables in Attachment A list all individual sample analyte results, whether or not the value or qualifier was changed as a result of the validation. Sample-specific quantitation limits may be found on the laboratory-generated Form I for each sample (Attachment B) as well as on the data tables.

XI. Tentatively Identified Compounds (TIC)

Library searches were performed as required for the samples in this data set. A laboratory artifact at approximate retention time (RT) 15.3 minutes was reported in VBLKAE and VBLKCG; a laboratory artifact peak with a very similar mass spectrum was also reported in VBLKYS and in

VHBLKVU at RT 15.1 minutes. A second artifact peak was reported in VBLKYS and VHBLKVU, at RT 13.2 minutes; this peak was tentatively identified as a siloxane (column bleed) compound.

Based on its presence in the associated method blank and its identification as a laboratory artifact, the TIC peak at approximate RT 15.3 minutes in SW01PB, SW01DPPB, GW07PB, GW08PB, and GW10TBPB were rejected (R).

A second TIC peak was reported in SW01PB, at RT 14.3 minutes. Although not reported in the associated MB, a peak was present in the MB chromatogram at the same RT. In addition, the mass spectrum for the sample peak suggests a siloxane (column bleed) compound. Therefore, based on professional judgment, the TIC peak reported at RT 14.3 minutes in SW01PB was rejected (R).

No other TICs were reported in any of the samples in this data set.

XII. System Performance

The GC/MS systems appear to have been working satisfactorily at the time of these analyses, based on review of the available raw data.

The presence of 1,2-dichloroethane in all four spiked analyses at concentrations ranging from 0.5 µg/L to 1 µg/L and its absence in both unspiked sample analyses (see Section VI) suggests that the spiking solution may be contaminated. The laboratory should be requested to investigate this situation and implement any necessary corrective actions as soon as possible.

XIII. Documentation

Two chain of custody (COC) records applicable to these samples were provided for review. The following issues were noted:

- Analysis of VOCs was not specified on the COC for SW01PB and SW01DPPB.
- A second, facsimile copy of COC #061476 was also included. The facsimile was signed by the same person and showed the same date/time of laboratory receipt as the "original." However, the two signatures are not identical and the facsimile does not contain two laboratory notations regarding sample condition on laboratory receipt that are on the "original." No explanation for this additional copy of one of the COC records was provided by the laboratory.
- Despite a specific request on the COCs, sample pHs on laboratory receipt were not recorded on the COCs.

- Copies of the courier airbills were not included in the data package to document the shipment portion of the sample transfers. An airbill number, however, was documented on each COC record.

- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should not be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are laboratory-initiated quality control; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

No traffic reports (COCs and laboratory receiving logs and reports) were included in the data package for SDG No. RW1067. The applicable pages from the data package for SDG No. RU1067 were copied and inserted into the RW1067 package as pages 55A-55H by the validator.

These documentation issues do not directly affect the technical validity of the data generated for these samples, however some of them could be problematic if the data were to be used in litigation.

XIV. Overall Assessment

Results for volatile compounds in the samples reported in SDG Nos. RU1067 and RW1067 were qualified as follows based on the validation effort:

- Results for methylene chloride in all samples were qualified as less than the contract required quantitation limit based on contamination in the associated method blanks and as estimated based on a high %RSD in the associated IC (10 UJ).

- Results for acetone in SW04TBPB and chloromethane in GW09FBPB were qualified as estimated (J) based on unacceptably high %Ds in the associated CC standards.

- Results for toluene in all samples were qualified as less than the contract required quantitation limit (10 U) based on contamination in the associated method blanks.

- The result for acetone in GW07PB was qualified as less than the CRQL based on associated trip blank contamination and as estimated due to an elevated %D in the associated CC standard (10 UJ).

- Results for trichloroethene and chlorobenzene in GW08PB were qualified as estimated (J, UJ) due to unacceptably low recoveries in the matrix spike analyses.

- The result for carbon disulfide in SW01DPPB was qualified as not detected at the CRQL (10 U) due to lack of confirmation at a very low concentration in the field duplicate analyses.

- The TIC peak at approximate RT 15.3 minutes in SW01PB, SW01DPPB, GW07PB, GW08PB, and GW10TBPB was rejected (R) based on the presence of a comparable peak in the associated method blank and its identification as a laboratory artifact.

- The TIC peak reported at RT 14.3 minutes in SW01PB was rejected (R) based on professional judgment and its identification as a laboratory artifact.

All "B" qualifiers, applied by the laboratory to indicate the presence of the analyte in the associated method blank, were removed by the validator. Laboratory-applied "J" qualifiers were not removed by the validator except where superceded by validator-applied qualifiers, as noted above.

Documentation issues observed in the data packages are discussed in Section XIII.

This validation report should be considered part of both data packages for all future distributions of the volatiles data.

TRILLIUM INC.

ATTACHMENT A

DATA TABLES
SDG Nos. RU1067 and RW1067
Volatiles in Water - Marion Bragg, September 2002

Marion Bragg Landfill - September 2002 - Volatiles in Ground and Surface Waters

Results are in ug/L

Collection Point ==========>		MB-1	MB-1D	MB-2	Field Blank
Sample ID ==========>		GW08PB	GW08DPPB	GW07PB	GW09FBPB
Lab Sample No. ==========>		RW1067-8	RW1067-9	RW1067-7	RW1067-10
Collection Date. ==========>		9/18/02	9/18/02	9/18/02	9/18/02
	CRQL				
Dichlorodifluoromethane	10	10 U	10 U	10 U	10 U
Chloromethane	10	10 U	10 U	10 U	0.5 J
Vinyl Chloride	10	0.9 J	0.9 J	10	10 U
Bromomethane	10	10 U	10 U	10 U	10 U
Chloroethane	10	10 U	10 U	10 U	10 U
Trichlorofluoromethane	10	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	10	10 U	10 U	10 U	10 U
Acetone	10	10 U	10 U	10 UJ	10 U
Carbon Disulfide	10	10 U	10 U	0.4 J	10 U
Methyl acetate	10	10 U	10 U	10 U	10 U
Methylene chloride	10	10 UJ	10 UJ	10 UJ	10 UJ
trans-1,2-dichloroethene	10	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	10	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10	10 U	10 U	10 U	10 U
cis-1,2-dichloroethene	10	5 J	5 J	3 J	10 U
2-Butanone	10	10 U	10 U	10 U	10 U
Chloroform	10	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	10	10 U	10 U	10 U	10 U
Cyclohexane	10	10 U	10 U	10 U	10 U
Carbon Tetrachloride	10	10 U	10 U	10 U	10 U
Benzene	10	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10	10 U	10 U	10 U	10 U
Trichloroethene	10	56 J	65	10 U	0.9 J
Methylcyclohexane	10	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10	10 U	10 U	10 U	10 U
Bromodichloromethane	10	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10	10 U	10 U	10 U	10 U
Toluene	10	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	10	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10	10 U	10 U	10 U	10 U
Tetrachloroethene	10	10 U	10 U	10 U	10 U
2-Hexanone	10	10 U	10 U	10 U	10 U
Dibromochloromethane	10	10 U	10 U	10 U	10 U
1,2-Dibromoethane	10	10 U	10 U	10 U	10 U
Chlorobenzene	10	10 UJ	10 U	1 J	10 U
Ethylbenzene	10	10 U	10 U	10 U	10 U
Total Xylenes	10	10 U	10 U	10 U	10 U
Styrene	10	10 U	10 U	10 U	10 U
Bromoform	10	10 U	10 U	10 U	10 U
Isopropylbenzene	10	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	10	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	10	10 U	10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	10	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10	10 U	10 U	10 U	10 U

Marion Bragg Landfill - September 2002 - Volatiles in Ground and Surface Waters

Results are in ug/L

Collection Point ==========>		Trip Blank	SW-1	SW-1D	Trip Blank
Sample ID ==========>		GW10TBPB	SW01PB	SW01DPPB	SW04TBPB
Lab Sample No. ==========>		RW1067-11	RU1067-1	RU1067-2	RU1067-6
Collection Date. ==========>		9/18/02	9/17/02	9/17/02	9/17/02
	CRQL				
Dichlorodifluoromethane	10	10 U	10 U	10 U	10 U
Chloromethane	10	10 U	10 U	10 U	10 U
Vinyl Chloride	10	10 U	10 U	10 U	10 U
Bromomethane	10	10 U	10 U	10 U	10 U
Chloroethane	10	10 U	10 U	10 U	10 U
Trichlorofluoromethane	10	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	10	10 U	10 U	10 U	10 U
Acetone	10	10 U	10 U	10 U	6 J
Carbon Disulfide	10	10 U	10 U	10 U	10 U
Methyl acetate	10	10 U	10 U	10 U	10 U
Methylene chloride	10	10 UJ	10 UJ	10 UJ	10 UJ
trans-1,2-dichloroethene	10	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	10	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10	10 U	10 U	10 U	10 U
cis-1,2-dichloroethene	10	10 U	10 U	10 U	10 U
2-Butanone	10	10 U	10 U	10 U	10 U
Chloroform	10	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	10	10 U	10 U	10 U	10 U
Cyclohexane	10	10 U	10 U	10 U	10 U
Carbon Tetrachloride	10	10 U	10 U	10 U	10 U
Benzene	10	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10	10 U	10 U	10 U	10 U
Trichloroethene	10	10 U	10 U	10 U	10 U
Methylcyclohexane	10	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10	10 U	10 U	10 U	10 U
Bromodichloromethane	10	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10	10 U	10 U	10 U	10 U
Toluene	10	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	10	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10	10 U	10 U	10 U	10 U
Tetrachloroethene	10	10 U	10 U	10 U	10 U
2-Hexanone	10	10 U	10 U	10 U	10 U
Dibromochloromethane	10	10 U	10 U	10 U	10 U
1,2-Dibromoethane	10	10 U	10 U	10 U	10 U
Chlorobenzene	10	10 U	10 U	10 U	10 U
Ethylbenzene	10	10 U	10 U	10 U	10 U
Total Xylenes	10	10 U	10 U	10 U	10 U
Styrene	10	10 U	10 U	10 U	10 U
Bromoform	10	10 U	10 U	10 U	10 U
Isopropylbenzene	10	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	10	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	10	10 U	10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	10	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10	10 U	10 U	10 U	10 U

TRILLIUM INC.

ATTACHMENT B

ORGANIC ANALYSIS DATA SHEETS (Form I)
SDG Nos. RU1067 and RW1067
Volatiles in Water - Marion Bragg, September 2002

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW08PB
MB-1
CAE 11/7/02

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-8

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-8A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	0.9	J
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
79-20-9	Methyl Acetate	10	U
75-09-2	Methylene Chloride	10 ~~2~~ ~~JB~~ UJ	
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl tert-Butyl Ether	10	U
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	5	J
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	U
56-23-5	Carbon Tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U

CAErikson 11/7/02

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW08PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-8

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-8A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
79-01-6	Trichloroethene	56	J
108-87-2	Methylcyclohexane	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
108-88-3	Toluene	10 ~~0.6~~	~~JB~~ U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	10	U UJ
100-41-4	Ethylbenzene	10	U
1330-20-7	Xylene (Total)	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

CAE 11/7/02

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW08PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-8

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-8A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~LABORATORY ARTIFACT~~	~~15.29~~	~~5~~	~~JB~~ R
2.					CAS 11/7/02
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW08DPPB MB-1D

CAE 11/7/08

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-9

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-9A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	0.9	J
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
79-20-9	Methyl Acetate	10	U
75-09-2	Methylene Chloride	10 ~~2~~	~~JB~~ UJ
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl tert-Butyl Ether	10	U
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	5	J
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	U
56-23-5	Carbon Tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U

CAE 11/7/08

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW08DPPB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-9

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-9A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
79-01-6	Trichloroethene	65	
108-87-2	Methylcyclohexane	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
108-88-3	Toluene	10 ~~0.5~~ ~~JB~~	U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
1330-20-7	Xylene (Total)	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

CAE 11/7/02

1F

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

GW08DPPB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-9

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-9A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW07PB
MB-2
CAE 11/7/02

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-7

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-7A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
67-64-1	Acetone	10 ~~6~~	~~J~~ UJ
75-15-0	Carbon Disulfide	0.4	J
79-20-9	Methyl Acetate	10	U
75-09-2	Methylene Chloride	10 ~~3~~	~~JB~~ UJ
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl tert-Butyl Ether	10	U
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	3	J
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	U
56-23-5	Carbon Tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U

CAE 11/7/02

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW07PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-7

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-7A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
79-01-6	Trichloroethene	10	U
108-87-2	Methylcyclohexane	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
108-88-3	Toluene	10 ~~0.7~~ ~~JB~~ U	
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	1	J
100-41-4	Ethylbenzene	10	U
1330-20-7	Xylene (Total)	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

CAE 11/7/02

1F

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

GW07PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-7

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-7A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~LABORATORY ARTIFACT~~	~~15.30~~	~~5~~	~~JB~~ R CAE 11/7/02
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW09FBPB
Field Blank
CAE 11/7/02

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-10

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-10A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	0.5	J
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
79-20-9	Methyl Acetate	10	U
75-09-2	Methylene Chloride	10 2	JB UJ
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl tert-Butyl Ether	10	U
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	10	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	U
56-23-5	Carbon Tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U

CAE 11/7/02

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW09FBPB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-10

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-10A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
79-01-6	Trichloroethene	0.9	J
108-87-2	Methylcyclohexane	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
108-88-3	Toluene	10 ~~0.5~~	~~JB~~ U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
1330-20-7	Xylene (Total)	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

CAE 11/7/02

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW09FBPB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-10

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-10A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW10TBPB
Trip Blank
CAE 11/7/02

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-11

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-11A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
79-20-9	Methyl Acetate	10	U
75-09-2	Methylene Chloride	10 ~~3~~	~~JB~~ UJ
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl tert-Butyl Ether	10	U
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	10	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	U
56-23-5	Carbon Tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U

CAE 11/7/02

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW10TBPB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-11

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-11A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
79-01-6	Trichloroethene	10	U
108-87-2	Methylcyclohexane	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
108-88-3	Toluene	10 ~~0.8~~	~~JB~~ U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
1330-20-7	Xylene (Total)	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

CAE 11/7/02

1F

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

GW10TBPB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-11

Sample wt/vol: 5 (g/mL) ML Lab File ID: RW1067-11A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~LABORATORY ARTIFACT~~	~~15.29~~	~~5~~	~~JB~~ R
2.					CAS 11/7/02
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW01PB

SW-1

CAE 11/7/02

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-1

Sample wt/vol: 5 (g/mL) ML Lab File ID: RU1067-1A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/25/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
79-20-9	Methyl Acetate	10	U
75-09-2	Methylene Chloride	10 ~~2~~	~~JB~~ UJ
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl tert-Butyl Ether	10	U
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	10	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	U
56-23-5	Carbon Tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U

QE 11/7/02

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW01PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-1

Sample wt/vol: 5 (g/mL) ML Lab File ID: RU1067-1A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/25/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
79-01-6	Trichloroethene	10	U
108-87-2	Methylcyclohexane	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
108-88-3	Toluene	10 ~~0.5~~ ~~JB~~ U	
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
1330-20-7	Xylene (Total)	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

CAE 11/7/02

1F

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SW01PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-1

Sample wt/vol: 5 (g/mL) ML Lab File ID: RU1067-1A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/25/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 2 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~LABORATORY ARTIFACT~~	~~14.32~~	~~6~~	~~J~~ R
2.		~~LABORATORY ARTIFACT~~	~~15.29~~	~~6~~	~~JB~~ R
3.					CAG 11/7/02
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW01DPPB
SW-1D
CAE 11/7/02

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-2

Sample wt/vol: 5 (g/mL) ML Lab File ID: RU1067-2RA73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10 ~~0.9~~	~~J~~ U
79-20-9	Methyl Acetate	10	U
75-09-2	Methylene Chloride	10 ~~3~~	~~JB~~ UJ
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl tert-Butyl Ether	10	U
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	10	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	U
56-23-5	Carbon Tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U

CAE 11/7/02

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW01DPPB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-2

Sample wt/vol: 5 (g/mL) ML Lab File ID: RU1067-2RA73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
79-01-6	Trichloroethene	10	U
108-87-2	Methylcyclohexane	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
108-88-3	Toluene	~~0.5~~ 10	~~JB~~ U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
1330-20-7	Xylene (Total)	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

CAE 11/7/02

1F

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SW01DPPB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-2

Sample wt/vol: 5 (g/mL) ML Lab File ID: RU1067-2RA73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/26/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~LABORATORY ARTIFACT~~	~~15.29~~	~~5~~	~~JB~~ R
2.					CAE 11/7/02
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW04TBPB
Trip Blank
CAE 11/7/02

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-6

Sample wt/vol: 5 (g/mL) ML Lab File ID: RU1067-6A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/25/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl Chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
67-64-1	Acetone	6	J
75-15-0	Carbon Disulfide	10	U
79-20-9	Methyl Acetate	10	U
75-09-2	Methylene Chloride	10 ~~2~~	~~JB~~ UJ
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl tert-Butyl Ether	10	U
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	10	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	U
56-23-5	Carbon Tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U

CAE 11/7/02

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW04TBPB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-6

Sample wt/vol: 5 (g/mL) ML Lab File ID: RU1067-6A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/25/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
79-01-6	Trichloroethene	10	U
108-87-2	Methylcyclohexane	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
108-88-3	Toluene	10 ~~0.7~~ ~~JB~~ U	
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
1330-20-7	Xylene (Total)	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-Chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

CAE 11/7/02

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SW04TBPB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-6

Sample wt/vol: 5 (g/mL) ML Lab File ID: RU1067-6A73

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: not dec. _____ Date Analyzed: 09/25/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

TRILLIUM INC.

DATA VALIDATION

FOR

MARION BRAGG LANDFILL
MARION, INDIANA

ORGANIC ANALYSIS DATA
Semivolatiles in Water

SDG Nos. RU1067 and RW1067
September 2002 Sample Collections

Chemical Analyses Performed by:
CompuChem Environmental
Cary, North Carolina

FOR

O & M, Inc.
Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, Tennessee 37922
(865) 966-8880

November 12, 2002

92241/CAE/ESC
\MARION\Sept02\BNA

TRILLIUM INC.

EXECUTIVE SUMMARY

Validation of the semivolatile organics analysis data prepared by CompuChem Environmental for 14 water samples and one field blank from the Marion Bragg Landfill site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in two data packages under Sample Delivery Group (SDG) Nos. RU1067 and RW1067, which were received for review on October 4, 2002, with additional documentation provided on November 11, 2002. The following samples were reported:

SDG No. RW1067:

GW08PB (MB-1)	GW08DPPB (MB-1D)	GW07PB (MB-2)
GW03PB (MB-5)	GW04PB (MB-6)	GW05PB (MB-7)
GW06PB (MB-8)	GW02PB (MB-9)	GW01PB (MB-10)
GW09FBPB (Field Blank)		

SDG No. RU1067:

PW01PB (PW-1)	SW01PB (SW-1)	SW01DPPB (SW-1D)
SW02PB (SW-5)	SW03PB (SW-6)	

Findings of the validation effort resulted in the following qualifications of sample results:

- Results for bis(2-ethylhexyl)phthalate in GW08PB, GW03PB, GW04PB, GW05PB, GW02PB, and GW01PB were qualified as less than the sample-specific contract required quantitation limit.
- Results for the three alkanes (RTs 19.5, 20.3, and 21.1 minutes) reported in GW08PB were rejected (R).
- To maintain consistency with historical project data, sample-specific CRQLs for all samples were adjusted by the validator as listed in Section XI.
- The peak identified as 1,1,2,2-tetrachloroethane (RT 5.01 minutes) in PW01PB was rejected (R).
- The complete compound name for the peak at RT 14.48 minutes [4,4'-(1-methylethylidene) bis phenol] in GW04PB was added to the Form I-TIC for this sample.
- The complete compound names for the peak at RT 13.21 minutes [2,4-dichloro-1-(trichloromethyl) benzene] and the peak at RT 13.53 minutes [1,4,5,6,7,7-

hexachloro-bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic acid] in GW06PB were added to the Form I-TIC for this sample.

- The tentative identification reported by the laboratory for the peak at RT 8.74 minutes in GW07PB was changed to "tert butyl phenol isomer" (from p-tert butyl phenol) by the validator and the "N" qualifier was removed.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section XV). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section XIV.

This validation report should be considered part of both data packages for all future distributions of the semivolatiles data.

INTRODUCTION

Analyses were performed according to the USEPA Contract Laboratory Program (CLP) Statement of Work (SOW) for Organics Analyses OLM04.2. Results of sample analyses are reported by the laboratory as either qualified or unqualified; various qualifier codes are used to denote specific information regarding the analytical results.

Validation was performed in conformance with the USEPA "Contract Laboratory Program National Functional Guidelines for Organic Data Review" (EPA 540/R-99/008, 10/99). The EPA Region II Standard Operating Procedure HW-6 (Rev 12), "Evaluation of Organics Data for the CLP," (3/01) was also considered during the evaluation and professional judgment was applied as necessary and appropriate.

The data validation process is intended to evaluate data on a technical basis rather than a contract compliance basis for chemical analyses conducted under the CLP. An initial assumption is that each data package is presented in accordance with the CLP requirements. It is also assumed that each data package represents the best efforts of the laboratory and has already been subjected to adequate and sufficient quality review prior to submission for validation.

During the validation process, laboratory data are verified against all available supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes in accordance with the National Functional Guidelines:

U - The material was analyzed for, but was not detected above the reported sample quantitation limit.

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

NJ - The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified, and the results are therefore unusable.

These codes are recorded on the customized data tables contained in Attachment A and the Organic Analysis Data Sheets (Form Is) in Attachment B of this validation report to indicate qualifications placed on the data as a result of the review.

Two facts should be noted by all data users. First, **the "R" qualifier means that the laboratory-reported value is unusable.** In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, **no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable.** Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.

I. Holding Times, Preservation and Sample Integrity

The samples were collected 9/17-18/02. Sample extractions were performed on 9/20/02, which is within the established (seven days from collection) holding time for all samples. Analyses were performed 9/23-24/02, well within the required holding time of 40 days from extraction. Therefore, both required holding times were met.

Acceptable (4°C ±2°C) cooler temperatures (4-6°C) on receipt at the laboratory were recorded on both COC records applicable to these samples. The same temperatures were also recorded on the laboratory's receiving logs in both data packages.

Sampler notations on each COC indicate that the samples for semivolatiles analysis were iced. The narrative in each data package further states that all samples were received intact and properly refrigerated.

II. GC/MS Instrument Performance Checks

Three decafluorotriphenylphosphine (DFTPP) instrument performance checks were run, representing every shift (12-hour period) during which samples or associated standards were analyzed. Results for all three instrument performance checks were acceptable.

III. Calibration

Analyses were performed on a single gas chromatograph/mass spectrometer (GC/MS) system identified as 5972HP66 (HP66). One or more target analytes required manual integration by the analyst in all of the standards associated with these samples. Documentation of each integration performed by the laboratory was provided in the data package; all manual integrations were correctly performed and accurately transcribed to the applicable quantitation report. Internal standard compound acenaphthene-d_{10} was manually integrated in two initial calibration standards, internal standard compound chrysene-d_{12} was manually integrated in one initial calibration standard, surrogate compound 2-chlorophenol-d_4 was manually integrated in one continuing calibration standard, surrogate compound phenol-d_5 was manually integrated in one continuing calibration standard and most of the samples, and surrogate compound 1,2-dichlorobenzene-d_4 was manually integrated in three initial calibration standards and all of the samples. These integrations were all fully documented and verified to be acceptable.

A. Initial Calibration (IC)

One IC (9/11-12/02 on HP66) was performed in support of the reported sample analyses. Documentation of all individual IC standards analyzed was present in both data packages and average relative response factor (RRF) as well as percent relative standard deviation (%RSD) values

were correctly calculated and accurately reported. All average RRFs were above the minimum response criterion (0.05) and all %RSDs were below the maximum acceptance criterion of 30%.

B. Continuing Calibration (CC)

Sample analyses were performed under two CC standards. Documentation of both CC standards was present in the applicable data package(s) and RRF as well as percent difference (%D) values were correctly calculated and accurately reported in all cases.

All RRFs were above the 0.05 minimum criterion in both of the CC standards. The following %D values were above the maximum acceptance criterion (25%):

9/23/02-14:13:	1,1'-biphenyl - 33.6%
	4,6-dinitro-2-methylphenol - 32.5%
	pentachlorophenol - 34.7%
9/24/02-11:42:	dimethylphthalate - 28.1%
	2,4-dinitrophenol - 49.8%
	4,6-dinitro-2-methylphenol - 34.9%
	terphenyl-d_{14} (SS) - 26.0%

No positive results were reported for the target analytes listed above in the samples associated with the affected CCs, the RRFs were all acceptable (i.e., were greater than 0.05) in the affected CC standards, and the %Ds were not substantially above the acceptance criterion (i.e., were not greater than 50%). In addition, no recovery problems were observed for the terphenyl-d_{14} surrogate in the associated sample analyses. Therefore, no qualifiers were applied based on the CC standard results.

IV. Blanks

One laboratory method blank (MB: SBLKGQ) was prepared and analyzed with the samples in this data set. No target analytes or tentatively identified compounds were detected in the MB.

One field blank (GW09FBPB) was submitted with the "GW" samples in this data set. Bis(2-ethylhexyl)phthalate (0.6 µg/L) was detected in the field blank. Results for bis(2-ethylhexyl)phthalate in GW08PB, GW03PB, GW04PB, GW05PB, GW02PB, and GW01PB were qualified as less than the sample-specific contract required quantitation limit (CRQL) because the reported values were less than ten times the concentration found in the associated field blank. No TICs were detected in GW09FBPB.

V. Surrogate Recoveries

Recoveries of the eight surrogate compounds in all site samples, spiked samples, and blanks were within the acceptance limits documented on the summary forms except for 2-fluorobiphenyl in GW03PB (126%; QC 43-116%) and GW09FBPB (123%), for terphenyl-d_{14} in GW06PB (23%; QC 33-141%), and for nitrobenzene-d_5 in SBLKGQ (116%; QC 35-114%). Since only one surrogate was outside the acceptance limits in each sample, no sample results were qualified on this basis.

Not all of the laboratory-reported surrogate recoveries could be reproduced by the validator. In numerous cases, the validator-calculated recovery was 1-2% higher or lower than the laboratory-reported value. In no case did the difference affect whether a surrogate recovery was within or outside the acceptance limits. Therefore, no action was taken on this basis.

VI. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Sample SW01PB was prepared and analyzed as an MS/MSD pair. Percent recoveries and relative percent differences (RPDs) between paired recoveries were correctly calculated, accurately reported, and within the acceptance limits documented on Form 3 except for the recoveries of 4-chloro-3-methylphenol (118% and 125%; QC 23-97%) and 4-nitrophenol (89% and 92%; QC 10-80%) in both spiked analyses. These high recoveries suggest the possibility of reporting false positives or detected results that are biased high. Since neither analyte was detected in the unspiked sample, no action was taken on this basis.

No unspiked target analytes were detected in any of the three analyses of SW01PB. Therefore, no further quantitative evaluation of precision could be made using these data.

Although requested on the COC records, no semivolatile MS/MSD analyses were performed on sample GW08PB. According to the narrative, this was due to a laboratory scheduling error.

VII. Laboratory Control Sample

A laboratory control sample (SGQLCS) was analyzed in association with the samples in data set, and was reported in lieu of the MS/MSD analyses of GW08PB. Percent recoveries were within the analyte-specific acceptance limits documented on the summary form except for 4-chloro-3-methylphenol (127%; QC 23-97%). The high recovery suggests the possibility of reporting false positives or positive results that are biased high. Since 4-chloro-3-methylphenol was not detected in any of the samples in this data set, no action was warranted on this basis.

VIII. Field Duplicates

Sample GW08DPPB was identified as a field duplicate of GW08PB. After qualifications based on associated field blank contamination, no target analytes were reported in either sample Therefore, no quantitative evaluation of precision could be made using these data.

No TICs were reported in GW08DPPB, but a TIC at 5.4 minutes was reported as an unknown at an estimated concentration of 3 µg/L in GW08PB. However, a small peak at the same RT was visible in the chromatogram for GW08DPPB; therefore, no action was taken based on this apparent discrepancy. Three alkanes (RTs 19.5, 20.3, and 21.1 minutes) were also reported in GW08PB, but no evidence of any alkanes was present in the chromatogram for GW08DPPB. Due to lack of confirmation in the field duplicate analyses, the results for all three alkane TICs in GW08PB were rejected (R).

Sample SW01DPPB was identified as a field duplicate of SW01PB. No target compounds or TICs were detected in either of these samples. Therefore, no quantitative evaluation of precision could be made using these data.

IX. Internal Standard (IS) Performance

All IS areas and RTs were within the acceptance limits (>50% and <200% of the area responses in the associated CC standard and within ±30 seconds, respectively) in all reported sample analyses.

X. Target Compound Identification

All reported target analytes were correctly identified with acceptable supporting mass spectra present in the applicable data packages.

XI. Compound Quantitation and Reported Detection Limits

Target compound concentrations were correctly calculated and accurately reported for all reported sample analyses, including adjustments for the extraction of slightly more than 1000 mL of all samples.

Adjustments were not made by the laboratory to the CRQLs to reflect the concentration factors applicable when more than 1000 mL of the sample was extracted. Although lowering the CRQLs under these circumstances is not required by the SOW and reporting the routine CRQLs is not technically incorrect, this adjustment has been made by the laboratory on previous data sets

generated for this project. Therefore, to maintain consistency with historical project data, CRQLs for the following samples were adjusted by the validator to reflect extraction of slightly larger sample volumes than specified by the SOW:

Sample ID	Laboratory-Reported CRQLs	Volume Extracted/ Concentration Factor	Validator-Adjusted CRQLs
GW08PB	10/25 µg/L	1100 mL	9/23 µg/L
GW08DPPB	10/25 µg/L	1075 mL	9/23 µg/L
GW07PB	10/25 µg/L	1100 mL	9/23 µg/L
GW03PB	10/25 µg/L	1075 mL	9/23 µg/L
GW04PB	10/25 µg/L	1050 mL	10/24 µg/L
GW05PB	10/25 µg/L	1050 mL	10/24 µg/L
GW06PB	10/25 µg/L	1075 mL	9/23 µg/L
GW02PB	10/25 µg/L	1075 mL	9/23 µg/L
GW01PB	10/25 µg/L	1100 mL	9/23 µg/L
GW09FBPB	10/25 µg/L	1125 mL	9/22 µg/L
PW01PB	10/25 µg/L	1100 mL	9/23 µg/L
SW01PB	10/25 µg/L	1050 mL	10/24 µg/L
SW01DPPB	10/25 µg/L	1125 mL	9/22 µg/L
SW02PB	10/25 µg/L	1100 mL	9/23 µg/L
SW03PB	10/25 µg/L	1100 mL	9/23 µg/L

The data tables in Attachment A list all individual sample analyte results, whether or not the value or qualifier was changed as a result of the validation. Sample-specific CRQLs may be found on the laboratory-generated Form I for each sample (Attachment B) and on the data tables.

XII. Tentatively Identified Compounds (TIC)

One to 30 TICs were reported in nine of the site samples in this data set; no TICs were found in the remaining samples.

The peak identified as 1,1,2,2-tetrachloroethane (RT 5.01 minutes) in PW01PB was rejected (R) by the validator because this is a volatile organics target analyte and, when present, should be reported from that analysis fraction. In the semivolatiles analysis, it may be an artifact reflecting dimerization of methylene chloride in the injection port.

The complete compound name for the peak at RT 14.48 minutes [4,4'-(1-methylethylidene) bis phenol] in GW04PB was added to the Form I-TIC for this sample by the validator.

The complete compound names for the peak at RT 13.21 minutes [2,4-dichloro-1-(trichloromethyl) benzene] and the peak at RT 13.53 minutes [1,4,5,6,7,7-hexachloro-bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic acid] in GW06PB were added to the Form I-TIC for this sample by the validator.

The tentative identification reported by the laboratory for the peak at RT 8.74 minutes in GW07PB was changed to "tert butyl phenol isomer" (from p-tert butyl phenol) by the validator, and the "N" qualifier applied by the laboratory was removed. It is not possible to distinguish between structural isomers without the use of calibration standards to establish retention times.

All reported TICs were appropriately qualified as "J" by the laboratory to emphasize that these are *estimated* concentrations. Those TICs that were appropriately identified as a specific compound based on the library search were also qualified as "N" to emphasize that these are *tentative* identifications. These "J" and "N" qualifiers were not removed by the validator.

The Form I-TIC for each sample, as reported by the laboratory and with qualifiers and corrections noted as described above, are included in Attachment B to this report.

XIII. System Performance

The analytical system appears to have been working within method specifications at the time of these analyses, based on evaluation of the available raw data.

XIV. Documentation

The samples reported in SDG Nos. RU1067 and RW1067 were recorded on two chain of custody (COC) records, both of which were included in both data packages. The following issues were noted:

- Sample PW01PB was not recorded by the sampler on either of the COCs. An appropriate notation to this effect was made by the laboratory on COC #061476.

- Copies of courier airbills were not included in either data package to document the shipment portion of the sample transfers. Airbill numbers, however, were documented on both of the COC records.

- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should not be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are laboratory-initiated quality control; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

Library searches for 10 of the 30 reported TIC peaks in GW06PB (SDG No. RW1067) were not included in the data package received for review. On request, the laboratory provided the missing documentation via UPS on 11/11/02. These pages were inserted into the data package as pages 218A to 218J by the validator.

These documentation issues do not directly affect the technical validity of the data generated for these samples, however some of them could be problematic if the data were to be used in litigation.

XV. Overall Assessment

Sample results were determined to be valid as reported with the following exceptions:

- Results for bis(2-ethylhexyl)phthalate in GW08PB, GW03PB, GW04PB, GW05PB, GW02PB, and GW01PB were qualified as less than the sample-specific CRQL based on contamination in the associated field blank.

- Results for the three alkanes (RTs 19.5, 20.3, and 21.1 minutes) reported in GW08PB were rejected (R) due to lack of confirmation in the field duplicate analyses.

- To maintain consistency with historical project data, sample-specific CRQLs for all samples were adjusted by the validator as listed in Section XI to reflect the effective concentration factors applicable because more than 1000 mL of each sample was extracted.

- The peak identified as 1,1,2,2-tetrachloroethane (RT 5.01 minutes) in PW01PB was rejected (R) by the validator because this is a volatile organics target analyte and, when present, it should be reported from that analysis fraction.

- The complete compound name for the peak at RT 14.48 minutes [4,4'-(1-methylethylidene) bis phenol] in GW04PB was added to the Form I-TIC for this sample by the validator.

- The complete compound names for the peak at RT 13.21 minutes [2,4-dichloro-1-(trichloromethyl) benzene] and the peak at RT 13.53 minutes [1,4,5,6,7,7-hexachloro-bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic acid] in GW06PB were added to the Form I-TIC for this sample by the validator.

- The tentative identification reported by the laboratory for the peak at RT 8.74 minutes in GW07PB was changed to "tert butyl phenol isomer" (from p-tert butyl phenol) by the validator and the "N" qualifier was removed. It is not possible to distinguish between structural isomers without the use of calibration standards to establish retention times.

Documentation issues are discussed in Section XIII.

This validation report should be considered part of both data packages for all future distributions of the semivolatiles data.

TRILLIUM INC.

ATTACHMENT A

DATA TABLES
SDG Nos. RU1067 and RW1067
Semivolatiles in Water
Marion Bragg Landfill - September 2002

Results are in ug/L

Collection Point ⟹		MB-1	MB-1D	MB-2	MB-5	MB-6	MB-7	MB-8	MB-9
Sample ID ⟹		GW08PB	GW08DPPB	GW07PB	GW03PB	GW04PB	GW05PB	GW06PB	GW02PB
Lab Sample No. ⟹		RW1067-8	RW1067-9	RW1067-7	RW1067-3	RW1067-4	RW1067-5	RW1067-6	RW1067-2
Collection Date. ⟹		9/18/02	9/18/02	9/18/02	9/18/02	9/18/02	9/18/02	9/18/02	9/18/02
Concentration Factor ⟹		0.91	0.93	0.91	0.93	0.95	0.95	0.93	0.93
	CRQL								
Benzaldehyde	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Phenol	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
bis(2-Chloroethyl)ether	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
2-Chlorophenol	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
2-Methylphenol	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
2,2'-oxybis(1-Chloropropane)	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Acetophenone	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
4-Methylphenol	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
N-Nitroso-di-n-propylamine	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Hexachloroethane	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Nitrobenzene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Isophorone	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
2-Nitrophenol	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
2,4-Dimethylphenol	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
bis(2-Chloroethoxy)methane	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
2,4-Dichlorophenol	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Naphthalene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
4-Chloroaniline	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Hexachlorobutadiene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Caprolactam	10	9 U	9 U	9 U	3 J	10 U	10 U	9 U	9 U
4-Chloro-3-methylphenol	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
2-Methylnaphthalene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Hexachlorocyclopentadiene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
2,4,6-Trichlorophenol	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
2,4,5-Trichlorophenol	25	23 U	23 U	23 U	23 U	24 U	24 U	23 U	23 U
1,1'-Biphenyl	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
2-Chloronaphthalene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
2-Nitroaniline	25	23 U	23 U	23 U	23 U	24 U	24 U	23 U	23 U
Dimethylphthalate	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
2,6-Dinitrotoluene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Acenaphthylene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
3-Nitroaniline	25	23 U	23 U	23 U	23 U	24 U	24 U	23 U	23 U
Acenaphthene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
2,4-Dinitrophenol	25	23 U	23 U	23 U	23 U	24 U	24 U	23 U	23 U
4-Nitrophenol	25	23 U	23 U	23 U	23 U	24 U	24 U	23 U	23 U
Dibenzofuran	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
2,4-Dinitrotoluene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Diethylphthalate	10	9 U	9 U	0.2 J	9 U	10 U	10 U	9 U	9 U
Fluorene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
4-Chlorophenyl-phenylether	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
4-Nitroaniline	25	23 U	23 U	23 U	23 U	24 U	24 U	23 U	23 U
4,6-Dinitro-2-methylphenol	25	23 U	23 U	23 U	23 U	24 U	24 U	23 U	23 U
N-nitrosodiphenylamine	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
4-Bromophenyl-phenylether	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Hexachlorobenzene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Atrazine	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Pentachlorophenol	25	23 U	23 U	23 U	23 U	24 U	24 U	23 U	23 U
Phenanthrene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Anthracene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Carbazole	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Di-n-butylphthalate	10	9 U	9 U	9 U	9 U	10 U	10 U	0.2 J	9 U
Fluoranthene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Pyrene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Butylbenzylphthalate	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
3,3'-Dichlorobenzidine	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Benzo(a)anthracene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Chrysene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
bis(2-Ethylhexyl)phthalate	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Di-n-octylphthalate	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Benzo(b)fluoranthene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Benzo(k)fluoranthene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Benzo(a)pyrene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Indeno(1,2,3-cd)pyrene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Dibenzo(a,h)anthracene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U
Benzo(g,h,i)perylene	10	9 U	9 U	9 U	9 U	10 U	10 U	9 U	9 U

Results are in ug/L

Collection Point ⟹		MB-10	Field Blank	PW-1	SW-1	SW-1D	SW-5	SW-6
Sample ID ⟹		GW01PB	GW09FBPB	PW01PB	SW01PB	SW01DPPB	SW02PB	SW03PB
Lab Sample No. ⟹		RW1067-1	RW1067-10	RU1067-5	RU1067-1	RU1067-2	RU1067-3	RU1067-4
Collection Date. ⟹		9/18/02	9/18/02	9/17/02	9/17/02	9/17/02	9/17/02	9/17/02
Concentration Factor ⟹		0.91	0.89	0.91	0.95	0.89	0.91	0.91
	CRQL							
Benzaldehyde	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Phenol	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
bis(2-Chloroethyl)ether	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
2-Chlorophenol	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
2-Methylphenol	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
2,2'-oxybis(1-Chloropropane)	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Acetophenone	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
4-Methylphenol	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
N-Nitroso-di-n-propylamine	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Hexachloroethane	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Nitrobenzene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Isophorone	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
2-Nitrophenol	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
2,4-Dimethylphenol	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
bis(2-Chloroethoxy)methane	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
2,4-Dichlorophenol	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Naphthalene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
4-Chloroaniline	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Hexachlorobutadiene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Caprolactam	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
4-Chloro-3-methylphenol	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
2-Methylnaphthalene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Hexachlorocyclopentadiene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
2,4,6-Trichlorophenol	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
2,4,5-Trichlorophenol	25	23 U	22 U	23 U	24 U	22 U	23 U	23 U
1,1'-Biphenyl	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
2-Chloronaphthalene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
2-Nitroaniline	25	23 U	22 U	23 U	24 U	22 U	23 U	23 U
Dimethylphthalate	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
2,6-Dinitrotoluene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Acenaphthylene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
3-Nitroaniline	25	23 U	22 U	23 U	24 U	22 U	23 U	23 U
Acenaphthene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
2,4-Dinitrophenol	25	23 U	22 U	23 U	24 U	22 U	23 U	23 U
4-Nitrophenol	25	23 U	22 U	23 U	24 U	22 U	23 U	23 U
Dibenzofuran	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
2,4-Dinitrotoluene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Diethylphthalate	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Fluorene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
4-Chlorophenyl-phenylether	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
4-Nitroaniline	25	23 U	22 U	23 U	24 U	22 U	23 U	23 U
4,6-Dinitro-2-methylphenol	25	23 U	22 U	23 U	24 U	22 U	23 U	23 U
N-nitrosodiphenylamine	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
4-Bromophenyl-phenylether	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Hexachlorobenzene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Atrazine	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Pentachlorophenol	25	23 U	22 U	23 U	24 U	22 U	23 U	23 U
Phenanthrene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Anthracene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Carbazole	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Di-n-butylphthalate	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Fluoranthene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Pyrene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Butylbenzylphthalate	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
3,3'-Dichlorobenzidine	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Benzo(a)anthracene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Chrysene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
bis(2-Ethylhexyl)phthalate	10	9 U	0.6 J	9 U	10 U	9 U	9 U	9 U
Di-n-octylphthalate	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Benzo(b)fluoranthene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Benzo(k)fluoranthene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Benzo(a)pyrene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Indeno(1,2,3-cd)pyrene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Dibenzo(a,h)anthracene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U
Benzo(g,h,i)perylene	10	9 U	9 U	9 U	10 U	9 U	9 U	9 U

TRILLIUM INC.

ATTACHMENT B

ORGANIC ANALYSIS DATA SHEETS (Form Is)
SDG Nos. RU1067 and RW1067
Semivolatiles in Water
Marion Bragg Landfill - September 2002

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW08PB MB-1 CAE 11/6/02

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-8

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RW1067-8A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	9 ~~10~~	U
108-95-2	Phenol	~~10~~	U
111-44-4	bis(2-Chloroethyl)ether	~~10~~	U
95-57-8	2-Chlorophenol	~~10~~	U
95-48-7	2-Methylphenol	~~10~~	U
108-60-1	2,2'-oxybis(1-Chloropropane)	~~10~~	U
98-86-2	Acetophenone	~~10~~	U
106-44-5	4-Methylphenol	~~10~~	U
621-64-7	N-Nitroso-di-n-propylamine	~~10~~	U
67-72-1	Hexachloroethane	~~10~~	U
98-95-3	Nitrobenzene	~~10~~	U
78-59-1	Isophorone	~~10~~	U
88-75-5	2-Nitrophenol	~~10~~	U
105-67-9	2,4-Dimethylphenol	~~10~~	U
111-91-1	bis(2-Chloroethoxy)methane	~~10~~	U
120-83-2	2,4-Dichlorophenol	~~10~~	U
91-20-3	Naphthalene	~~10~~	U
106-47-8	4-Chloroaniline	~~10~~	U
87-68-3	Hexachlorobutadiene	~~10~~	U
105-60-2	Caprolactam	~~10~~	U
59-50-7	4-Chloro-3-methylphenol	~~10~~	U
91-57-6	2-Methylnaphthalene	~~10~~	U
77-47-4	Hexachlorocyclopentadiene	~~10~~	U
88-06-2	2,4,6-Trichlorophenol	~~10~~	U
95-95-4	2,4,5-Trichlorophenol	23 ~~25~~	U
92-52-4	1,1'-Biphenyl	9 ~~10~~	U
91-58-7	2-Chloronaphthalene	9 ~~10~~	U
88-74-4	2-Nitroaniline	23 ~~25~~	U
131-11-3	Dimethylphthalate	9 ~~10~~	U
606-20-2	2,6-Dinitrotoluene	9 ~~10~~	U
208-96-8	Acenaphthylene	9 ~~10~~	U
99-09-2	3-Nitroaniline	23 ~~25~~	U
83-32-9	Acenaphthene	9 ~~10~~	U

CAErikson 11/13/02

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW08PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-8

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RW1067-8A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	23 ~~25~~	U
100-02-7	4-Nitrophenol	23 ~~25~~	U
132-64-9	Dibenzofuran	9 ~~10~~	U
121-14-2	2,4-Dinitrotoluene	~~10~~	U
84-66-2	Diethylphthalate	~~10~~	U
86-73-7	Fluorene	~~10~~	U
7005-72-3	4-Chlorophenyl-phenylether	~~10~~	U
100-01-6	4-Nitroaniline	23 ~~25~~	U
534-52-1	4,6-Dinitro-2-methylphenol	23 ~~25~~	U
86-30-6	N-nitrosodiphenylamine (1)	9 ~~10~~	U
101-55-3	4-Bromophenyl-phenylether	~~10~~	U
118-74-1	Hexachlorobenzene	~~10~~	U
1912-24-9	Atrazine	~~10~~	U
87-86-5	Pentachlorophenol	23 ~~25~~	U
85-01-8	Phenanthrene	9 ~~10~~	U
120-12-7	Anthracene	~~10~~	U
86-74-8	Carbazole	~~10~~	U
84-74-2	Di-n-butylphthalate	~~10~~	U
206-44-0	Fluoranthene	~~10~~	U
129-00-0	Pyrene	~~10~~	U
85-68-7	Butylbenzylphthalate	~~10~~	U
91-94-1	3,3'-Dichlorobenzidine	~~10~~	U
56-55-3	Benzo(a)anthracene	~~10~~	U
218-01-9	Chrysene	~~10~~	U
117-81-7	bis(2-Ethylhexyl)phthalate	~~1~~	~~J~~ U
117-84-0	Di-n-octylphthalate	~~10~~	U
205-99-2	Benzo(b)fluoranthene	~~10~~	U
207-08-9	Benzo(k)fluoranthene	~~10~~	U
50-32-8	Benzo(a)pyrene	~~10~~	U
193-39-5	Indeno(1,2,3-cd)pyrene	~~10~~	U
53-70-3	Dibenzo(a,h)anthracene	~~10~~	U
191-24-2	Benzo(g,h,i)perylene	~~10~~	U

(1) - Cannot be separated from Diphenylamine

CA Erickson 11/12/02

1G

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

GW08PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-8

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RW1067-8A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Extraction: (Type) CONT

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	5.40	3	J
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

ALKANE NARRATIVE REPORT
Report date : 10/02/2002
SDG: RW1067

ient Sample ID: GW08PB Lab Sample ID: RW1067-8 File ID: RW1067-8A66

mpound	RT	Est. Conc.	Q	
~~raight-Chain Alkane~~	~~19.47~~	~~2~~	~~J~~	R
~~raight-Chain Alkane~~	~~20.33~~	~~2~~	~~J~~	R
~~ranched Alkane~~	~~21.09~~	~~2~~	~~J~~	R

MB-1 CAE 11/15/02

CAE 11/15/02

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW08DPPB
MB-1D

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

CAE 11/6/02

Matrix: (soil/water) WATER Lab Sample ID: RW1067-9

Sample wt/vol: 1075 (g/mL) ML Lab File ID: RW1067-9A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	9 ~~10~~	U
108-95-2	Phenol	~~10~~	U
111-44-4	bis(2-Chloroethyl)ether	~~10~~	U
95-57-8	2-Chlorophenol	~~10~~	U
95-48-7	2-Methylphenol	~~10~~	U
108-60-1	2,2'-oxybis(1-Chloropropane)	~~10~~	U
98-86-2	Acetophenone	~~10~~	U
106-44-5	4-Methylphenol	~~10~~	U
621-64-7	N-Nitroso-di-n-propylamine	~~10~~	U
67-72-1	Hexachloroethane	~~10~~	U
98-95-3	Nitrobenzene	~~10~~	U
78-59-1	Isophorone	~~10~~	U
88-75-5	2-Nitrophenol	~~10~~	U
105-67-9	2,4-Dimethylphenol	~~10~~	U
111-91-1	bis(2-Chloroethoxy)methane	~~10~~	U
120-83-2	2,4-Dichlorophenol	~~10~~	U
91-20-3	Naphthalene	~~10~~	U
106-47-8	4-Chloroaniline	~~10~~	U
87-68-3	Hexachlorobutadiene	~~10~~	U
105-60-2	Caprolactam	~~10~~	U
59-50-7	4-Chloro-3-methylphenol	~~10~~	U
91-57-6	2-Methylnaphthalene	~~10~~	U
77-47-4	Hexachlorocyclopentadiene	~~10~~	U
88-06-2	2,4,6-Trichlorophenol	~~10~~	U
95-95-4	2,4,5-Trichlorophenol	23 ~~25~~	U
92-52-4	1,1'-Biphenyl	9 ~~10~~	U
91-58-7	2-Chloronaphthalene	9 ~~10~~	U
88-74-4	2-Nitroaniline	23 ~~25~~	U
131-11-3	Dimethylphthalate	9 ~~10~~	U
606-20-2	2,6-Dinitrotoluene	~~10~~	U
208-96-8	Acenaphthylene	~~10~~	U
99-09-2	3-Nitroaniline	23 25	U
83-32-9	Acenaphthene	9 ~~10~~	U

CAErikson 11/13/02

1D

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

GW08DPPB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-9

Sample wt/vol: 1075 (g/mL) ML Lab File ID: RW1067-9A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	23 ~~25~~	U
100-02-7	4-Nitrophenol	23 ~~25~~	U
132-64-9	Dibenzofuran	9 ~~10~~	U
121-14-2	2,4-Dinitrotoluene	~~10~~	U
84-66-2	Diethylphthalate	~~10~~	U
86-73-7	Fluorene	~~10~~	U
7005-72-3	4-Chlorophenyl-phenylether	~~10~~	U
100-01-6	4-Nitroaniline	23 ~~25~~	U
534-52-1	4,6-Dinitro-2-methylphenol	23 ~~25~~	U
86-30-6	N-nitrosodiphenylamine (1)	9 ~~10~~	U
101-55-3	4-Bromophenyl-phenylether	~~10~~	U
118-74-1	Hexachlorobenzene	~~10~~	U
1912-24-9	Atrazine	~~10~~	U
87-86-5	Pentachlorophenol	23 ~~25~~	U
85-01-8	Phenanthrene	9 ~~10~~	U
120-12-7	Anthracene	~~10~~	U
86-74-8	Carbazole	~~10~~	U
84-74-2	Di-n-butylphthalate	~~10~~	U
206-44-0	Fluoranthene	~~10~~	U
129-00-0	Pyrene	~~10~~	U
85-68-7	Butylbenzylphthalate	~~10~~	U
91-94-1	3,3'-Dichlorobenzidine	~~10~~	U
56-55-3	Benzo(a)anthracene	~~10~~	U
218-01-9	Chrysene	~~10~~	U
117-81-7	bis(2-Ethylhexyl)phthalate	~~10~~	U
117-84-0	Di-n-octylphthalate	~~10~~	U
205-99-2	Benzo(b)fluoranthene	~~10~~	U
207-08-9	Benzo(k)fluoranthene	~~10~~	U
50-32-8	Benzo(a)pyrene	~~10~~	U
193-39-5	Indeno(1,2,3-cd)pyrene	~~10~~	U
53-70-3	Dibenzo(a,h)anthracene	~~10~~	U
191-24-2	Benzo(g,h,i)perylene	~~10~~	U

(1) - Cannot be separated from Diphenylamine

CAE 11/12/02

1G

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

GW08DPPB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-9

Sample wt/vol: 1075 (g/mL) ML Lab File ID: RW1067-9A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Extraction: (Type) CONT

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW07PB MB-2 CAE 11/6/02

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-7

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RW1067-7A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	9 ~~10~~	U
108-95-2	Phenol	~~10~~	U
111-44-4	bis(2-Chloroethyl)ether	~~10~~	U
95-57-8	2-Chlorophenol	~~10~~	U
95-48-7	2-Methylphenol	~~10~~	U
108-60-1	2,2'-oxybis(1-Chloropropane)	~~10~~	U
98-86-2	Acetophenone	~~10~~	U
106-44-5	4-Methylphenol	~~10~~	U
621-64-7	N-Nitroso-di-n-propylamine	~~10~~	U
67-72-1	Hexachloroethane	~~10~~	U
98-95-3	Nitrobenzene	~~10~~	U
78-59-1	Isophorone	~~10~~	U
88-75-5	2-Nitrophenol	~~10~~	U
105-67-9	2,4-Dimethylphenol	~~10~~	U
111-91-1	bis(2-Chloroethoxy)methane	~~10~~	U
120-83-2	2,4-Dichlorophenol	~~10~~	U
91-20-3	Naphthalene	~~10~~	U
106-47-8	4-Chloroaniline	~~10~~	U
87-68-3	Hexachlorobutadiene	~~10~~	U
105-60-2	Caprolactam	~~10~~	U
59-50-7	4-Chloro-3-methylphenol	~~10~~	U
91-57-6	2-Methylnaphthalene	~~10~~	U
77-47-4	Hexachlorocyclopentadiene	~~10~~	U
88-06-2	2,4,6-Trichlorophenol	~~10~~	U
95-95-4	2,4,5-Trichlorophenol	23 ~~25~~	U
92-52-4	1,1'-Biphenyl	9 ~~10~~	U
91-58-7	2-Chloronaphthalene	9 ~~10~~	U
88-74-4	2-Nitroaniline	23 ~~25~~	U
131-11-3	Dimethylphthalate	9 ~~10~~	U
606-20-2	2,6-Dinitrotoluene	~~10~~	U
208-96-8	Acenaphthylene	~~10~~	U
99-09-2	3-Nitroaniline	23 ~~25~~	U
83-32-9	Acenaphthene	9 ~~10~~	U

CA Erickson 11/18/02

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW07PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-7

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RW1067-7A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	~~23~~ ~~25~~	U
100-02-7	4-Nitrophenol	~~23~~ ~~25~~	U
132-64-9	Dibenzofuran	~~9~~ ~~10~~	U
121-14-2	2,4-Dinitrotoluene	~~9~~ ~~10~~	U
84-66-2	Diethylphthalate	0.2	J
86-73-7	Fluorene	~~9~~ ~~10~~	U
7005-72-3	4-Chlorophenyl-phenylether	~~9~~ ~~10~~	U
100-01-6	4-Nitroaniline	~~23~~ ~~25~~	U
534-52-1	4,6-Dinitro-2-methylphenol	~~23~~ ~~25~~	U
86-30-6	N-nitrosodiphenylamine (1)	~~9~~ ~~10~~	U
101-55-3	4-Bromophenyl-phenylether	~~10~~	U
118-74-1	Hexachlorobenzene	~~10~~	U
1912-24-9	Atrazine	~~10~~	U
87-86-5	Pentachlorophenol	~~23~~ ~~25~~	U
85-01-8	Phenanthrene	~~9~~ ~~10~~	U
120-12-7	Anthracene	~~10~~	U
86-74-8	Carbazole	~~10~~	U
84-74-2	Di-n-butylphthalate	~~10~~	U
206-44-0	Fluoranthene	~~10~~	U
129-00-0	Pyrene	~~10~~	U
85-68-7	Butylbenzylphthalate	~~10~~	U
91-94-1	3,3'-Dichlorobenzidine	~~10~~	U
56-55-3	Benzo(a)anthracene	~~10~~	U
218-01-9	Chrysene	~~10~~	U
117-81-7	bis(2-Ethylhexyl)phthalate	~~10~~	U
117-84-0	Di-n-octylphthalate	~~10~~	U
205-99-2	Benzo(b)fluoranthene	~~10~~	U
207-08-9	Benzo(k)fluoranthene	~~10~~	U
50-32-8	Benzo(a)pyrene	~~10~~	U
193-39-5	Indeno(1,2,3-cd)pyrene	~~10~~	U
53-70-3	Dibenzo(a,h)anthracene	~~10~~	U
191-24-2	Benzo(g,h,i)perylene	~~10~~	U

(1) - Cannot be separated from Diphenylamine

CAE 11/12/02

1G

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

GW07PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-7

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RW1067-7A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Extraction: (Type) CONT

Number TICs found: 5 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	5.40	2	J
2.		UNKNOWN	5.80	3	J
3.	~~98-54-4~~	PHENOL, ~~P~~-TERT-BUTYL- ISOMER	8.74	3	NJ
4.		UNKNOWN	9.45	3	J
5.		UNKNOWN	14.18	11	J
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

CASERSON 11/12/02

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW03PB MB-5 CAE 11/6/02

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-3

Sample wt/vol: 1075 (g/mL) ML Lab File ID: RW1067-3A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	9 ~~10~~	U
108-95-2	Phenol	~~10~~	U
111-44-4	bis(2-Chloroethyl)ether	~~10~~	U
95-57-8	2-Chlorophenol	~~10~~	U
95-48-7	2-Methylphenol	~~10~~	U
108-60-1	2,2'-oxybis(1-Chloropropane)	~~10~~	U
98-86-2	Acetophenone	~~10~~	U
106-44-5	4-Methylphenol	~~10~~	U
621-64-7	N-Nitroso-di-n-propylamine	~~10~~	U
67-72-1	Hexachloroethane	~~10~~	U
98-95-3	Nitrobenzene	~~10~~	U
78-59-1	Isophorone	~~10~~	U
88-75-5	2-Nitrophenol	~~10~~	U
105-67-9	2,4-Dimethylphenol	~~10~~	U
111-91-1	bis(2-Chloroethoxy)methane	~~10~~	U
120-83-2	2,4-Dichlorophenol	~~10~~	U
91-20-3	Naphthalene	~~10~~	U
106-47-8	4-Chloroaniline	~~10~~	U
87-68-3	Hexachlorobutadiene	~~10~~	U
105-60-2	Caprolactam	3	J
59-50-7	4-Chloro-3-methylphenol	9 ~~10~~	U
91-57-6	2-Methylnaphthalene	~~10~~	U
77-47-4	Hexachlorocyclopentadiene	~~10~~	U
88-06-2	2,4,6-Trichlorophenol	~~10~~	U
95-95-4	2,4,5-Trichlorophenol	23 ~~25~~	U
92-52-4	1,1'-Biphenyl	9 ~~10~~	U
91-58-7	2-Chloronaphthalene	9 ~~10~~	U
88-74-4	2-Nitroaniline	23 ~~25~~	U
131-11-3	Dimethylphthalate	9 ~~10~~	U
606-20-2	2,6-Dinitrotoluene	~~10~~	U
208-96-8	Acenaphthylene	~~10~~	U
99-09-2	3-Nitroaniline	23 ~~25~~	U
83-32-9	Acenaphthene	9 ~~10~~	U

CAE 11/12/02

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW03PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-3

Sample wt/vol: 1075 (g/mL) ML Lab File ID: RW1067-3A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	23 ~~25~~	U
100-02-7	4-Nitrophenol	23 ~~25~~	U
132-64-9	Dibenzofuran	9 ~~10~~	U
121-14-2	2,4-Dinitrotoluene	~~10~~	U
84-66-2	Diethylphthalate	~~10~~	U
86-73-7	Fluorene	~~10~~	U
7005-72-3	4-Chlorophenyl-phenylether	~~10~~	U
100-01-6	4-Nitroaniline	23 ~~25~~	U
534-52-1	4,6-Dinitro-2-methylphenol	23 ~~25~~	U
86-30-6	N-nitrosodiphenylamine (1)	9 ~~10~~	U
101-55-3	4-Bromophenyl-phenylether	~~10~~	U
118-74-1	Hexachlorobenzene	~~10~~	U
1912-24-9	Atrazine	~~10~~	U
87-86-5	Pentachlorophenol	23 ~~25~~	U
85-01-8	Phenanthrene	9 ~~10~~	U
120-12-7	Anthracene	~~10~~	U
86-74-8	Carbazole	~~10~~	U
84-74-2	Di-n-butylphthalate	~~10~~	U
206-44-0	Fluoranthene	~~10~~	U
129-00-0	Pyrene	~~10~~	U
85-68-7	Butylbenzylphthalate	~~10~~	U
91-94-1	3,3'-Dichlorobenzidine	~~10~~	U
56-55-3	Benzo(a)anthracene	~~10~~	U
218-01-9	Chrysene	~~10~~	U
117-81-7	bis(2-Ethylhexyl)phthalate	9 ~~1~~	~~J~~ U
117-84-0	Di-n-octylphthalate	~~10~~	U
205-99-2	Benzo(b)fluoranthene	~~10~~	U
207-08-9	Benzo(k)fluoranthene	~~10~~	U
50-32-8	Benzo(a)pyrene	~~10~~	U
193-39-5	Indeno(1,2,3-cd)pyrene	~~10~~	U
53-70-3	Dibenzo(a,h)anthracene	~~10~~	U
191-24-2	Benzo(g,h,i)perylene	~~10~~	U

(1) - Cannot be separated from Diphenylamine

CAE 11/12/02

1G

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

GW03PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-3

Sample wt/vol: 1075 (g/mL) ML Lab File ID: RW1067-3A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Extraction: (Type) CONT

Number TICs found: 4 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	10.55	2	J
2.	134-62-3	DIETHYLTOLUAMIDE	10.90	71	NJ
3.		UNKNOWN	12.47	2	J
4.	10544-50-0	SULFUR, MOL. (S8)	13.99	11	NJ
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW04PB
MB-6
CAE 11/6/02

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-4

Sample wt/vol: 1050 (g/mL) ML Lab File ID: RW1067-4A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	24 ~~25~~	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	24 ~~25~~	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	24 ~~25~~	U
83-32-9	Acenaphthene	10	U

CAE 11/12/02

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW04PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-4

Sample wt/vol: 1050 (g/mL) ML Lab File ID: RW1067-4A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	24 ~~25~~	U
100-02-7	4-Nitrophenol	24 ~~25~~	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
100-01-6	4-Nitroaniline	24 ~~25~~	U
534-52-1	4,6-Dinitro-2-methylphenol	24 ~~25~~	U
86-30-6	N-nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	24 ~~25~~	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10 ~~0.6~~	~~J~~ U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

CA Erikson 11/12/08

1G

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

GW04PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-4

Sample wt/vol: 1050 (g/mL) ML Lab File ID: RW1067-4A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Extraction: (Type) CONT

Number TICs found: 6 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	7.61	6	J
2.		UNKNOWN	9.45	5	J
3.	934-34-9	2(3H)-BENZOTHIAZOLONE	11.59	10	NJ
4.		UNKNOWN	14.18	22	J
5.	80-05-7	PHENOL, 4,4'-(1-METHYLETHYLI*	14.48	3	NJ
6.		UNKNOWN	15.42	5	J
7.					
8.					
9.					
10.					
11.					
12.		* 4,4'-(1-methylethylidene) bis phenol			
13.			CAE 11/12/02		
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW05PB
MB-7
CAE 11/6/02

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-5

Sample wt/vol: 1050 (g/mL) ML Lab File ID: RW1067-5A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	24 ~~25~~	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	24 ~~25~~	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	24 ~~25~~	U
83-32-9	Acenaphthene	10	U

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW05PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-5

Sample wt/vol: 1050 (g/mL) ML Lab File ID: RW1067-5A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	24 ~~25~~	U
100-02-7	4-Nitrophenol	24 ~~25~~	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
100-01-6	4-Nitroaniline	24 ~~25~~	U
534-52-1	4,6-Dinitro-2-methylphenol	24 ~~25~~	U
86-30-6	N-nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	24 ~~25~~	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10 ~~0.8~~	~~J~~ U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

CAErikson 11/12/02

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW05PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-5

Sample wt/vol: 1050 (g/mL) ML Lab File ID: RW1067-5A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Extraction: (Type) CONT

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	11.60	2	J
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW06PB
MB-8
CAE 11/6/02

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-6

Sample wt/vol: 1075 (g/mL) ML Lab File ID: RW1067-6A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	9 ~~10~~	U
108-95-2	Phenol	~~10~~	U
111-44-4	bis(2-Chloroethyl)ether	~~10~~	U
95-57-8	2-Chlorophenol	~~10~~	U
95-48-7	2-Methylphenol	~~10~~	U
108-60-1	2,2'-oxybis(1-Chloropropane)	~~10~~	U
98-86-2	Acetophenone	~~10~~	U
106-44-5	4-Methylphenol	~~10~~	U
621-64-7	N-Nitroso-di-n-propylamine	~~10~~	U
67-72-1	Hexachloroethane	~~10~~	U
98-95-3	Nitrobenzene	~~10~~	U
78-59-1	Isophorone	~~10~~	U
88-75-5	2-Nitrophenol	~~10~~	U
105-67-9	2,4-Dimethylphenol	~~10~~	U
111-91-1	bis(2-Chloroethoxy)methane	~~10~~	U
120-83-2	2,4-Dichlorophenol	~~10~~	U
91-20-3	Naphthalene	~~10~~	U
106-47-8	4-Chloroaniline	~~10~~	U
87-68-3	Hexachlorobutadiene	~~10~~	U
105-60-2	Caprolactam	~~10~~	U
59-50-7	4-Chloro-3-methylphenol	~~10~~	U
91-57-6	2-Methylnaphthalene	~~10~~	U
77-47-4	Hexachlorocyclopentadiene	~~10~~	U
88-06-2	2,4,6-Trichlorophenol	~~10~~	U
95-95-4	2,4,5-Trichlorophenol	23 ~~25~~	U
92-52-4	1,1'-Biphenyl	9 ~~10~~	U
91-58-7	2-Chloronaphthalene	9 ~~10~~	U
88-74-4	2-Nitroaniline	23 ~~25~~	U
131-11-3	Dimethylphthalate	9 ~~10~~	U
606-20-2	2,6-Dinitrotoluene	~~10~~	U
208-96-8	Acenaphthylene	~~10~~	U
99-09-2	3-Nitroaniline	23 ~~25~~	U
83-32-9	Acenaphthene	9 ~~10~~	U

CA Erikson 11/12/02

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW06PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-6

Sample wt/vol: 1075 (g/mL) ML Lab File ID: RW1067-6A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	23 ~~25~~	U
100-02-7	4-Nitrophenol	23 ~~25~~	U
132-64-9	Dibenzofuran	9 ~~10~~	U
121-14-2	2,4-Dinitrotoluene	~~10~~	U
84-66-2	Diethylphthalate	~~10~~	U
86-73-7	Fluorene	~~10~~	U
7005-72-3	4-Chlorophenyl-phenylether	~~10~~	U
100-01-6	4-Nitroaniline	23 ~~25~~	U
534-52-1	4,6-Dinitro-2-methylphenol	23 ~~25~~	U
86-30-6	N-nitrosodiphenylamine (1)	9 ~~10~~	U
101-55-3	4-Bromophenyl-phenylether	~~10~~	U
118-74-1	Hexachlorobenzene	~~10~~	U
1912-24-9	Atrazine	~~10~~	U
87-86-5	Pentachlorophenol	23 ~~25~~	U
85-01-8	Phenanthrene	9 ~~10~~	U
120-12-7	Anthracene	~~10~~	U
86-74-8	Carbazole	~~10~~	U
84-74-2	Di-n-butylphthalate	0.2	J
206-44-0	Fluoranthene	9 ~~10~~	U
129-00-0	Pyrene	~~10~~	U
85-68-7	Butylbenzylphthalate	~~10~~	U
91-94-1	3,3'-Dichlorobenzidine	~~10~~	U
56-55-3	Benzo(a)anthracene	~~10~~	U
218-01-9	Chrysene	~~10~~	U
117-81-7	bis(2-Ethylhexyl)phthalate	~~10~~	U
117-84-0	Di-n-octylphthalate	~~10~~	U
205-99-2	Benzo(b)fluoranthene	~~10~~	U
207-08-9	Benzo(k)fluoranthene	~~10~~	U
50-32-8	Benzo(a)pyrene	~~10~~	U
193-39-5	Indeno(1,2,3-cd)pyrene	~~10~~	U
53-70-3	Dibenzo(a,h)anthracene	~~10~~	U
191-24-2	Benzo(g,h,i)perylene	~~10~~	U

(1) - Cannot be separated from Diphenylamine

CRE 11/12/02

1G

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

GW06PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-6

Sample wt/vol: 1075 (g/mL) ML Lab File ID: RW1067-6A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Extraction: (Type) CONT

Number TICs found: 30 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	5.26	3	J
2.		UNKNOWN	5.53	4	J
3.		UNKNOWN	6.32	3	J
4.		UNKNOWN	7.62	3	J
5.		UNKNOWN	8.69	4	J
6.	85-44-9	PHTHALIC ANHYDRIDE	9.01	3	NJ
7.		UNKNOWN	9.14	4	J
8.		UNKNOWN	9.46	3	J
9.		UNKNOWN	9.63	3	J
10.		UNKNOWN	11.08	4	J
11.		UNKNOWN	11.19	3	J
12.		UNKNOWN	11.24	3	J
13.		UNKNOWN	12.82	3	J
14.	13014-18-1	BENZENE, 2,4-DICHLORO-1-(TRI	* 13.21	5	NJ
15.	115-28-6	BICYCLO[2.2.1]HEPT-5-ENE-2,3	** 13.53	9	NJ
16.		UNKNOWN	13.57	3	J
17.		UNKNOWN	14.17	22	J
18.		UNKNOWN	14.29	3	J
19.		UNKNOWN	14.34	4	J
20.		UNKNOWN	14.39	5	J
21.		UNKNOWN	15.15	3	J
22.		UNKNOWN	15.19	3	J
23.		UNKNOWN	15.24	3	J
24.		UNKNOWN	15.29	4	J
25.		UNKNOWN	15.37	7	J
26.		UNKNOWN	15.61	4	J
27.		UNKNOWN	15.64	4	J
28.		UNKNOWN	15.69	4	J
29.		UNKNOWN	16.54	4	J
30.		UNKNOWN	18.45	2	J

* 2,4-dichloro-1-(trichloromethyl)benzene

** 1,4,5,6,7,7-hexachloro-bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic acid

CAE 11/12/02

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW02PB MB-9

CAE 11/6/02

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-2

Sample wt/vol: 1075 (g/mL) ML Lab File ID: RW1067-2A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	9 ~~10~~	U
108-95-2	Phenol	~~10~~	U
111-44-4	bis(2-Chloroethyl)ether	~~10~~	U
95-57-8	2-Chlorophenol	~~10~~	U
95-48-7	2-Methylphenol	~~10~~	U
108-60-1	2,2'-oxybis(1-Chloropropane)	~~10~~	U
98-86-2	Acetophenone	~~10~~	U
106-44-5	4-Methylphenol	~~10~~	U
621-64-7	N-Nitroso-di-n-propylamine	~~10~~	U
67-72-1	Hexachloroethane	~~10~~	U
98-95-3	Nitrobenzene	~~10~~	U
78-59-1	Isophorone	~~10~~	U
88-75-5	2-Nitrophenol	~~10~~	U
105-67-9	2,4-Dimethylphenol	~~10~~	U
111-91-1	bis(2-Chloroethoxy)methane	~~10~~	U
120-83-2	2,4-Dichlorophenol	~~10~~	U
91-20-3	Naphthalene	~~10~~	U
106-47-8	4-Chloroaniline	~~10~~	U
87-68-3	Hexachlorobutadiene	~~10~~	U
105-60-2	Caprolactam	~~10~~	U
59-50-7	4-Chloro-3-methylphenol	~~10~~	U
91-57-6	2-Methylnaphthalene	~~10~~	U
77-47-4	Hexachlorocyclopentadiene	~~10~~	U
88-06-2	2,4,6-Trichlorophenol	~~10~~	U
95-95-4	2,4,5-Trichlorophenol	23 ~~25~~	U
92-52-4	1,1'-Biphenyl	9 ~~10~~	U
91-58-7	2-Chloronaphthalene	9 ~~10~~	U
88-74-4	2-Nitroaniline	23 ~~25~~	U
131-11-3	Dimethylphthalate	9 ~~10~~	U
606-20-2	2,6-Dinitrotoluene	9 ~~10~~	U
208-96-8	Acenaphthylene	9 ~~10~~	U
99-09-2	3-Nitroaniline	23 ~~25~~	U
83-32-9	Acenaphthene	9 ~~10~~	U

CAE 11/12/08

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW02PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-2

Sample wt/vol: 1075 (g/mL) ML Lab File ID: RW1067-2A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	23 ~~25~~	U
100-02-7	4-Nitrophenol	23 ~~25~~	U
132-64-9	Dibenzofuran	9 ~~10~~	U
121-14-2	2,4-Dinitrotoluene	~~10~~	U
84-66-2	Diethylphthalate	~~10~~	U
86-73-7	Fluorene	~~10~~	U
7005-72-3	4-Chlorophenyl-phenylether	~~10~~	U
100-01-6	4-Nitroaniline	23 ~~25~~	U
534-52-1	4,6-Dinitro-2-methylphenol	23 ~~25~~	U
86-30-6	N-nitrosodiphenylamine (1)	9 ~~10~~	U
101-55-3	4-Bromophenyl-phenylether	~~10~~	U
118-74-1	Hexachlorobenzene	~~10~~	U
1912-24-9	Atrazine	~~10~~	U
87-86-5	Pentachlorophenol	23 ~~25~~	U
85-01-8	Phenanthrene	9 ~~10~~	U
120-12-7	Anthracene	~~10~~	U
86-74-8	Carbazole	~~10~~	U
84-74-2	Di-n-butylphthalate	~~10~~	U
206-44-0	Fluoranthene	~~10~~	U
129-00-0	Pyrene	~~10~~	U
85-68-7	Butylbenzylphthalate	~~10~~	U
91-94-1	3,3'-Dichlorobenzidine	~~10~~	U
56-55-3	Benzo(a)anthracene	~~10~~	U
218-01-9	Chrysene	~~10~~	U
117-81-7	bis(2-Ethylhexyl)phthalate	9 ~~2~~	J U
117-84-0	Di-n-octylphthalate	~~10~~	U
205-99-2	Benzo(b)fluoranthene	~~10~~	U
207-08-9	Benzo(k)fluoranthene	~~10~~	U
50-32-8	Benzo(a)pyrene	~~10~~	U
193-39-5	Indeno(1,2,3-cd)pyrene	~~10~~	U
53-70-3	Dibenzo(a,h)anthracene	~~10~~	U
191-24-2	Benzo(g,h,i)perylene	~~10~~	U

(1) - Cannot be separated from Diphenylamine

CAE 11/12/02

1G

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

GW02PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-2

Sample wt/vol: 1075 (g/mL) ML Lab File ID: RW1067-2A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Extraction: (Type) CONT

Number TICs found: 2 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	5.39	3	J
2.		UNKNOWN	17.96	2	J
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW01PB
MB-10
CAE 11/6/02

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-1

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RW1067-1A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	9 ~~10~~	U
108-95-2	Phenol	~~10~~	U
111-44-4	bis(2-Chloroethyl)ether	~~10~~	U
95-57-8	2-Chlorophenol	~~10~~	U
95-48-7	2-Methylphenol	~~10~~	U
108-60-1	2,2'-oxybis(1-Chloropropane)	~~10~~	U
98-86-2	Acetophenone	~~10~~	U
106-44-5	4-Methylphenol	~~10~~	U
621-64-7	N-Nitroso-di-n-propylamine	~~10~~	U
67-72-1	Hexachloroethane	~~10~~	U
98-95-3	Nitrobenzene	~~10~~	U
78-59-1	Isophorone	~~10~~	U
88-75-5	2-Nitrophenol	~~10~~	U
105-67-9	2,4-Dimethylphenol	~~10~~	U
111-91-1	bis(2-Chloroethoxy)methane	~~10~~	U
120-83-2	2,4-Dichlorophenol	~~10~~	U
91-20-3	Naphthalene	~~10~~	U
106-47-8	4-Chloroaniline	~~10~~	U
87-68-3	Hexachlorobutadiene	~~10~~	U
105-60-2	Caprolactam	~~10~~	U
59-50-7	4-Chloro-3-methylphenol	~~10~~	U
91-57-6	2-Methylnaphthalene	~~10~~	U
77-47-4	Hexachlorocyclopentadiene	~~10~~	U
88-06-2	2,4,6-Trichlorophenol	~~10~~	U
95-95-4	2,4,5-Trichlorophenol	23 ~~25~~	U
92-52-4	1,1'-Biphenyl	9 ~~10~~	U
91-58-7	2-Chloronaphthalene	9 ~~10~~	U
88-74-4	2-Nitroaniline	23 ~~25~~	U
131-11-3	Dimethylphthalate	9 ~~10~~	U
606-20-2	2,6-Dinitrotoluene	~~10~~	U
208-96-8	Acenaphthylene	~~10~~	U
99-09-2	3-Nitroaniline	23 ~~25~~	U
83-32-9	Acenaphthene	9 ~~10~~	U

CAE 11/12/02

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW01PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-1

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RW1067-1A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	23 ~~25~~	U
100-02-7	4-Nitrophenol	23 ~~25~~	U
132-64-9	Dibenzofuran	9 ~~10~~	U
121-14-2	2,4-Dinitrotoluene	~~10~~	U
84-66-2	Diethylphthalate	~~10~~	U
86-73-7	Fluorene	~~10~~	U
7005-72-3	4-Chlorophenyl-phenylether	~~10~~	U
100-01-6	4-Nitroaniline	23 ~~25~~	U
534-52-1	4,6-Dinitro-2-methylphenol	23 ~~25~~	U
86-30-6	N-nitrosodiphenylamine (1)	9 ~~10~~	U
101-55-3	4-Bromophenyl-phenylether	~~10~~	U
118-74-1	Hexachlorobenzene	~~10~~	U
1912-24-9	Atrazine	~~10~~	U
87-86-5	Pentachlorophenol	23 ~~25~~	U
85-01-8	Phenanthrene	9 ~~10~~	U
120-12-7	Anthracene	~~10~~	U
86-74-8	Carbazole	~~10~~	U
84-74-2	Di-n-butylphthalate	~~10~~	U
206-44-0	Fluoranthene	~~10~~	U
129-00-0	Pyrene	~~10~~	U
85-68-7	Butylbenzylphthalate	~~10~~	U
91-94-1	3,3'-Dichlorobenzidine	~~10~~	U
56-55-3	Benzo(a)anthracene	~~10~~	U
218-01-9	Chrysene	~~10~~	U
117-81-7	bis(2-Ethylhexyl)phthalate	9 ~~2~~	~~J~~ U
117-84-0	Di-n-octylphthalate	~~10~~	U
205-99-2	Benzo(b)fluoranthene	~~10~~	U
207-08-9	Benzo(k)fluoranthene	~~10~~	U
50-32-8	Benzo(a)pyrene	~~10~~	U
193-39-5	Indeno(1,2,3-cd)pyrene	~~10~~	U
53-70-3	Dibenzo(a,h)anthracene	~~10~~	U
191-24-2	Benzo(g,h,i)perylene	~~10~~	U

(1) - Cannot be separated from Diphenylamine

CAE 11/12/08

1G

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

GW01PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-1

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RW1067-1A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Extraction: (Type) CONT

Number TICs found: 6 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	5.40	2	J
2.		UNKNOWN	5.80	78	J
3.		UNKNOWN	6.73	5	J
4.		UNKNOWN	8.72	10	J
5.		UNKNOWN	9.23	4	J
6.	134-62-3	DIETHYLTOLUAMIDE	10.90	9	NJ
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW09FBPB
Field Blank
CAE 11/6/02

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-10

Sample wt/vol: 1125 (g/mL) ML Lab File ID: RW1067-10A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	9 ~~10~~	U
108-95-2	Phenol	~~10~~	U
111-44-4	bis(2-Chloroethyl)ether	~~10~~	U
95-57-8	2-Chlorophenol	~~10~~	U
95-48-7	2-Methylphenol	~~10~~	U
108-60-1	2,2'-oxybis(1-Chloropropane)	~~10~~	U
98-86-2	Acetophenone	~~10~~	U
106-44-5	4-Methylphenol	~~10~~	U
621-64-7	N-Nitroso-di-n-propylamine	~~10~~	U
67-72-1	Hexachloroethane	~~10~~	U
98-95-3	Nitrobenzene	~~10~~	U
78-59-1	Isophorone	~~10~~	U
88-75-5	2-Nitrophenol	~~10~~	U
105-67-9	2,4-Dimethylphenol	~~10~~	U
111-91-1	bis(2-Chloroethoxy)methane	~~10~~	U
120-83-2	2,4-Dichlorophenol	~~10~~	U
91-20-3	Naphthalene	~~10~~	U
106-47-8	4-Chloroaniline	~~10~~	U
87-68-3	Hexachlorobutadiene	~~10~~	U
105-60-2	Caprolactam	~~10~~	U
59-50-7	4-Chloro-3-methylphenol	~~10~~	U
91-57-6	2-Methylnaphthalene	~~10~~	U
77-47-4	Hexachlorocyclopentadiene	~~10~~	U
88-06-2	2,4,6-Trichlorophenol	~~10~~	U
95-95-4	2,4,5-Trichlorophenol	22 ~~25~~	U
92-52-4	1,1'-Biphenyl	9 ~~10~~	U
91-58-7	2-Chloronaphthalene	9 ~~10~~	U
88-74-4	2-Nitroaniline	22 ~~25~~	U
131-11-3	Dimethylphthalate	9 ~~10~~	U
606-20-2	2,6-Dinitrotoluene	~~10~~	U
208-96-8	Acenaphthylene	~~10~~	U
99-09-2	3-Nitroaniline	22 ~~25~~	U
83-32-9	Acenaphthene	9 ~~10~~	U

CAE 11/12/02

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW09FBPB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-10

Sample wt/vol: 1125 (g/mL) ML Lab File ID: RW1067-10A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	~~22~~ ~~25~~	U
100-02-7	4-Nitrophenol	~~22~~ ~~25~~	U
132-64-9	Dibenzofuran	9 ~~10~~	U
121-14-2	2,4-Dinitrotoluene	~~10~~	U
84-66-2	Diethylphthalate	~~10~~	U
86-73-7	Fluorene	~~10~~	U
7005-72-3	4-Chlorophenyl-phenylether	~~10~~	U
100-01-6	4-Nitroaniline	~~22~~ ~~25~~	U
534-52-1	4,6-Dinitro-2-methylphenol	~~22~~ 25	U
86-30-6	N-nitrosodiphenylamine (1)	9 ~~10~~	U
101-55-3	4-Bromophenyl-phenylether	~~10~~	U
118-74-1	Hexachlorobenzene	~~10~~	U
1912-24-9	Atrazine	~~10~~	U
87-86-5	Pentachlorophenol	~~22~~ ~~25~~	U
85-01-8	Phenanthrene	9 ~~10~~	U
120-12-7	Anthracene	~~10~~	U
86-74-8	Carbazole	~~10~~	U
84-74-2	Di-n-butylphthalate	~~10~~	U
206-44-0	Fluoranthene	~~10~~	U
129-00-0	Pyrene	~~10~~	U
85-68-7	Butylbenzylphthalate	~~10~~	U
91-94-1	3,3'-Dichlorobenzidine	~~10~~	U
56-55-3	Benzo(a)anthracene	~~10~~	U
218-01-9	Chrysene	~~10~~	U
117-81-7	bis(2-Ethylhexyl)phthalate	0.6	J
117-84-0	Di-n-octylphthalate	9 ~~10~~	U
205-99-2	Benzo(b)fluoranthene	~~10~~	U
207-08-9	Benzo(k)fluoranthene	~~10~~	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	~~10~~	U
53-70-3	Dibenzo(a,h)anthracene	~~10~~	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

ME 11/12/02

1G

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

GW09FBPB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix: (soil/water) WATER Lab Sample ID: RW1067-10

Sample wt/vol: 1125 (g/mL) ML Lab File ID: RW1067-10A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Extraction: (Type) CONT

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PW01PB

PW-1

CAE 11/6/02

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-5

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RU1067-5A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/23/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	9 ~~10~~	U
108-95-2	Phenol	~~10~~	U
111-44-4	bis(2-Chloroethyl)ether	~~10~~	U
95-57-8	2-Chlorophenol	~~10~~	U
95-48-7	2-Methylphenol	~~10~~	U
108-60-1	2,2'-oxybis(1-Chloropropane)	~~10~~	U
98-86-2	Acetophenone	~~10~~	U
106-44-5	4-Methylphenol	~~10~~	U
621-64-7	N-Nitroso-di-n-propylamine	~~10~~	U
67-72-1	Hexachloroethane	~~10~~	U
98-95-3	Nitrobenzene	~~10~~	U
78-59-1	Isophorone	~~10~~	U
88-75-5	2-Nitrophenol	~~10~~	U
105-67-9	2,4-Dimethylphenol	~~10~~	U
111-91-1	bis(2-Chloroethoxy)methane	~~10~~	U
120-83-2	2,4-Dichlorophenol	~~10~~	U
91-20-3	Naphthalene	~~10~~	U
106-47-8	4-Chloroaniline	~~10~~	U
87-68-3	Hexachlorobutadiene	~~10~~	U
105-60-2	Caprolactam	~~10~~	U
59-50-7	4-Chloro-3-methylphenol	~~10~~	U
91-57-6	2-Methylnaphthalene	~~10~~	U
77-47-4	Hexachlorocyclopentadiene	~~10~~	U
88-06-2	2,4,6-Trichlorophenol	~~10~~	U
95-95-4	2,4,5-Trichlorophenol	23 ~~25~~	U
92-52-4	1,1'-Biphenyl	9 ~~10~~	U
91-58-7	2-Chloronaphthalene	9 ~~10~~	U
88-74-4	2-Nitroaniline	23 ~~25~~	U
131-11-3	Dimethylphthalate	9 ~~10~~	U
606-20-2	2,6-Dinitrotoluene	~~10~~	U
208-96-8	Acenaphthylene	~~10~~	U
99-09-2	3-Nitroaniline	23 ~~25~~	U
83-32-9	Acenaphthene	9 ~~10~~	U

CAE 11/12/02

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PW01PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-5

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RU1067-5A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/23/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	23 ~~25~~	U
100-02-7	4-Nitrophenol	23 ~~25~~	U
132-64-9	Dibenzofuran	9 ~~10~~	U
121-14-2	2,4-Dinitrotoluene	~~10~~	U
84-66-2	Diethylphthalate	~~10~~	U
86-73-7	Fluorene	~~10~~	U
7005-72-3	4-Chlorophenyl-phenylether	~~10~~	U
100-01-6	4-Nitroaniline	23 ~~25~~	U
534-52-1	4,6-Dinitro-2-methylphenol	23 ~~25~~	U
86-30-6	N-nitrosodiphenylamine (1)	9 ~~10~~	U
101-55-3	4-Bromophenyl-phenylether	~~10~~	U
118-74-1	Hexachlorobenzene	~~10~~	U
1912-24-9	Atrazine	~~10~~	U
87-86-5	Pentachlorophenol	23 ~~25~~	U
85-01-8	Phenanthrene	9 ~~10~~	U
120-12-7	Anthracene	~~10~~	U
86-74-8	Carbazole	~~10~~	U
84-74-2	Di-n-butylphthalate	~~10~~	U
206-44-0	Fluoranthene	~~10~~	U
129-00-0	Pyrene	~~10~~	U
85-68-7	Butylbenzylphthalate	~~10~~	U
91-94-1	3,3'-Dichlorobenzidine	~~10~~	U
56-55-3	Benzo(a)anthracene	~~10~~	U
218-01-9	Chrysene	~~10~~	U
117-81-7	bis(2-Ethylhexyl)phthalate	~~10~~	U
117-84-0	Di-n-octylphthalate	~~10~~	U
205-99-2	Benzo(b)fluoranthene	~~10~~	U
207-08-9	Benzo(k)fluoranthene	~~10~~	U
50-32-8	Benzo(a)pyrene	~~10~~	U
193-39-5	Indeno(1,2,3-cd)pyrene	~~10~~	U
53-70-3	Dibenzo(a,h)anthracene	~~10~~	U
191-24-2	Benzo(g,h,i)perylene	~~10~~	U

(1) - Cannot be separated from Diphenylamine

CAE 11/12/02

1G

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

PW01PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-5

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RU1067-5A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/23/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0 Extraction: (Type) CONT

Number TICs found: 2 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	~~79-34-5~~	~~ETHANE, 1,1,2,2-TETRACHLORO~~	~~5.01~~	~~2~~	~~NJ~~
2.	134-62-3	DIETHYLTOLUAMIDE	10.90	2	NJ
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

R

CAA 11/17/02

ALKANE NARRATIVE REPORT
Report date : 10/02/2002
SDG: RU1067

lient Sample ID: PW01PB Lab Sample ID: RU1067-5 File ID: RU1067-5A66

Compound	RT	Est. Conc.	Q
traight-Chain Alkane	11.53	3	J

PW-1 CAE 11/12/02

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW01PB
SW-1
CAE 11/6/02

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-1

Sample wt/vol: 1050 (g/mL) ML Lab File ID: RU1067-1A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/23/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	24 ~~25~~	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	24 ~~25~~	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	24 ~~25~~	U
83-32-9	Acenaphthene	10	U

CAE 11/18/02

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW01PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-1

Sample wt/vol: 1050 (g/mL) ML Lab File ID: RU1067-1A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/23/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	24 ~~25~~	U
100-02-7	4-Nitrophenol	24 ~~25~~	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
100-01-6	4-Nitroaniline	24 ~~25~~	U
534-52-1	4,6-Dinitro-2-methylphenol	24 ~~25~~	U
86-30-6	N-nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	24 ~~25~~	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

CAE 11/12/02

1G

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SW01PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-1

Sample wt/vol: 1050 (g/mL) ML Lab File ID: RU1067-1A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/23/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1C

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SW01DPPB
SW-1D

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067 CAE 11/6/02

Matrix: (soil/water) WATER Lab Sample ID: RU1067-2

Sample wt/vol: 1125 (g/mL) ML Lab File ID: RU1067-2A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/23/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	9 ~~10~~	U
108-95-2	Phenol	~~10~~	U
111-44-4	bis(2-Chloroethyl)ether	~~10~~	U
95-57-8	2-Chlorophenol	~~10~~	U
95-48-7	2-Methylphenol	~~10~~	U
108-60-1	2,2'-oxybis(1-Chloropropane)	~~10~~	U
98-86-2	Acetophenone	~~10~~	U
106-44-5	4-Methylphenol	~~10~~	U
621-64-7	N-Nitroso-di-n-propylamine	~~10~~	U
67-72-1	Hexachloroethane	~~10~~	U
98-95-3	Nitrobenzene	~~10~~	U
78-59-1	Isophorone	~~10~~	U
88-75-5	2-Nitrophenol	~~10~~	U
105-67-9	2,4-Dimethylphenol	~~10~~	U
111-91-1	bis(2-Chloroethoxy)methane	~~10~~	U
120-83-2	2,4-Dichlorophenol	~~10~~	U
91-20-3	Naphthalene	~~10~~	U
106-47-8	4-Chloroaniline	~~10~~	U
87-68-3	Hexachlorobutadiene	~~10~~	U
105-60-2	Caprolactam	~~10~~	U
59-50-7	4-Chloro-3-methylphenol	~~10~~	U
91-57-6	2-Methylnaphthalene	~~10~~	U
77-47-4	Hexachlorocyclopentadiene	~~10~~	U
88-06-2	2,4,6-Trichlorophenol	~~10~~	U
95-95-4	2,4,5-Trichlorophenol	22 ~~25~~	U
92-52-4	1,1'-Biphenyl	9 ~~10~~	U
91-58-7	2-Chloronaphthalene	9 ~~10~~	U
88-74-4	2-Nitroaniline	22 ~~25~~	U
131-11-3	Dimethylphthalate	9 ~~10~~	U
606-20-2	2,6-Dinitrotoluene	~~10~~	U
208-96-8	Acenaphthylene	~~10~~	U
99-09-2	3-Nitroaniline	~~22~~ ~~25~~	U
83-32-9	Acenaphthene	9 ~~10~~	U

CAE 11/12/02

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW01DPPB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-2

Sample wt/vol: 1125 (g/mL) ML Lab File ID: RU1067-2A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/23/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	~~22~~ ~~25~~	U
100-02-7	4-Nitrophenol	~~22~~ ~~25~~	U
132-64-9	Dibenzofuran	~~9~~ ~~10~~	U
121-14-2	2,4-Dinitrotoluene	~~10~~	U
84-66-2	Diethylphthalate	~~10~~	U
86-73-7	Fluorene	~~10~~	U
7005-72-3	4-Chlorophenyl-phenylether	~~10~~	U
100-01-6	4-Nitroaniline	~~22~~ ~~25~~	U
534-52-1	4,6-Dinitro-2-methylphenol	~~22~~ ~~25~~	U
86-30-6	N-nitrosodiphenylamine (1)	~~9~~ ~~10~~	U
101-55-3	4-Bromophenyl-phenylether	~~10~~	U
118-74-1	Hexachlorobenzene	~~10~~	U
1912-24-9	Atrazine	~~10~~	U
87-86-5	Pentachlorophenol	~~22~~ ~~25~~	U
85-01-8	Phenanthrene	~~9~~ ~~10~~	U
120-12-7	Anthracene	~~10~~	U
86-74-8	Carbazole	~~10~~	U
84-74-2	Di-n-butylphthalate	~~10~~	U
206-44-0	Fluoranthene	~~10~~	U
129-00-0	Pyrene	~~10~~	U
85-68-7	Butylbenzylphthalate	~~10~~	U
91-94-1	3,3'-Dichlorobenzidine	~~10~~	U
56-55-3	Benzo(a)anthracene	~~10~~	U
218-01-9	Chrysene	~~10~~	U
117-81-7	bis(2-Ethylhexyl)phthalate	~~10~~	U
117-84-0	Di-n-octylphthalate	~~10~~	U
205-99-2	Benzo(b)fluoranthene	~~10~~	U
207-08-9	Benzo(k)fluoranthene	~~10~~	U
50-32-8	Benzo(a)pyrene	~~10~~	U
193-39-5	Indeno(1,2,3-cd)pyrene	~~10~~	U
53-70-3	Dibenzo(a,h)anthracene	~~10~~	U
191-24-2	Benzo(g,h,i)perylene	~~10~~	U

(1) - Cannot be separated from Diphenylamine

CAE 11/18/02

1G

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SW01DPPB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-2

Sample wt/vol: 1125 (g/mL) ML Lab File ID: RU1067-2A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/23/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW02PB
SW-5
CAE 11/6/02

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-3

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RU1067-3A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/23/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	9 ~~10~~	U
108-95-2	Phenol	~~10~~	U
111-44-4	bis(2-Chloroethyl)ether	~~10~~	U
95-57-8	2-Chlorophenol	~~10~~	U
95-48-7	2-Methylphenol	~~10~~	U
108-60-1	2,2'-oxybis(1-Chloropropane)	~~10~~	U
98-86-2	Acetophenone	~~10~~	U
106-44-5	4-Methylphenol	~~10~~	U
621-64-7	N-Nitroso-di-n-propylamine	~~10~~	U
67-72-1	Hexachloroethane	~~10~~	U
98-95-3	Nitrobenzene	~~10~~	U
78-59-1	Isophorone	~~10~~	U
88-75-5	2-Nitrophenol	~~10~~	U
105-67-9	2,4-Dimethylphenol	~~10~~	U
111-91-1	bis(2-Chloroethoxy)methane	~~10~~	U
120-83-2	2,4-Dichlorophenol	~~10~~	U
91-20-3	Naphthalene	~~10~~	U
106-47-8	4-Chloroaniline	~~10~~	U
87-68-3	Hexachlorobutadiene	~~10~~	U
105-60-2	Caprolactam	~~10~~	U
59-50-7	4-Chloro-3-methylphenol	~~10~~	U
91-57-6	2-Methylnaphthalene	~~10~~	U
77-47-4	Hexachlorocyclopentadiene	~~10~~	U
88-06-2	2,4,6-Trichlorophenol	~~10~~	U
95-95-4	2,4,5-Trichlorophenol	23 ~~25~~	U
92-52-4	1,1'-Biphenyl	9 ~~10~~	U
91-58-7	2-Chloronaphthalene	9 ~~10~~	U
88-74-4	2-Nitroaniline	23 ~~25~~	U
131-11-3	Dimethylphthalate	9 ~~10~~	U
606-20-2	2,6-Dinitrotoluene	~~10~~	U
208-96-8	Acenaphthylene	~~10~~	U
99-09-2	3-Nitroaniline	23 ~~25~~	U
83-32-9	Acenaphthene	9 ~~10~~	U

CAE 11/12/02

1D

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SW02PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-3

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RU1067-3A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/23/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	23 ~~25~~	U
100-02-7	4-Nitrophenol	23 ~~25~~	U
132-64-9	Dibenzofuran	9 ~~10~~	U
121-14-2	2,4-Dinitrotoluene	~~10~~	U
84-66-2	Diethylphthalate	~~10~~	U
86-73-7	Fluorene	~~10~~	U
7005-72-3	4-Chlorophenyl-phenylether	~~10~~	U
100-01-6	4-Nitroaniline	23 ~~25~~	U
534-52-1	4,6-Dinitro-2-methylphenol	23 ~~25~~	U
86-30-6	N-nitrosodiphenylamine (1)	9 ~~10~~	U
101-55-3	4-Bromophenyl-phenylether	~~10~~	U
118-74-1	Hexachlorobenzene	~~10~~	U
1912-24-9	Atrazine	~~10~~	U
87-86-5	Pentachlorophenol	23 ~~25~~	U
85-01-8	Phenanthrene	9 ~~10~~	U
120-12-7	Anthracene	~~10~~	U
86-74-8	Carbazole	~~10~~	U
84-74-2	Di-n-butylphthalate	~~10~~	U
206-44-0	Fluoranthene	~~10~~	U
129-00-0	Pyrene	~~10~~	U
85-68-7	Butylbenzylphthalate	~~10~~	U
91-94-1	3,3'-Dichlorobenzidine	~~10~~	U
56-55-3	Benzo(a)anthracene	~~10~~	U
218-01-9	Chrysene	~~10~~	U
117-81-7	bis(2-Ethylhexyl)phthalate	~~10~~	U
117-84-0	Di-n-octylphthalate	~~10~~	U
205-99-2	Benzo(b)fluoranthene	~~10~~	U
207-08-9	Benzo(k)fluoranthene	~~10~~	U
50-32-8	Benzo(a)pyrene	~~10~~	U
193-39-5	Indeno(1,2,3-cd)pyrene	~~10~~	U
53-70-3	Dibenzo(a,h)anthracene	~~10~~	U
191-24-2	Benzo(g,h,i)perylene	~~10~~	U

(1) - Cannot be separated from Diphenylamine

CAE 11/12/08

1G

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SW02PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-3

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RU1067-3A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/23/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1C

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SW03PB
SW-6
CAE 11/6/02

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-4

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RU1067-4A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/23/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	9 ~~10~~	U
108-95-2	Phenol	~~10~~	U
111-44-4	bis(2-Chloroethyl)ether	~~10~~	U
95-57-8	2-Chlorophenol	~~10~~	U
95-48-7	2-Methylphenol	~~10~~	U
108-60-1	2,2'-oxybis(1-Chloropropane)	~~10~~	U
98-86-2	Acetophenone	~~10~~	U
106-44-5	4-Methylphenol	~~10~~	U
621-64-7	N-Nitroso-di-n-propylamine	~~10~~	U
67-72-1	Hexachloroethane	~~10~~	U
98-95-3	Nitrobenzene	~~10~~	U
78-59-1	Isophorone	~~10~~	U
88-75-5	2-Nitrophenol	~~10~~	U
105-67-9	2,4-Dimethylphenol	~~10~~	U
111-91-1	bis(2-Chloroethoxy)methane	~~10~~	U
120-83-2	2,4-Dichlorophenol	~~10~~	U
91-20-3	Naphthalene	~~10~~	U
106-47-8	4-Chloroaniline	~~10~~	U
87-68-3	Hexachlorobutadiene	~~10~~	U
105-60-2	Caprolactam	~~10~~	U
59-50-7	4-Chloro-3-methylphenol	~~10~~	U
91-57-6	2-Methylnaphthalene	~~10~~	U
77-47-4	Hexachlorocyclopentadiene	~~10~~	U
88-06-2	2,4,6-Trichlorophenol	~~10~~	U
95-95-4	2,4,5-Trichlorophenol	23 ~~25~~	U
92-52-4	1,1'-Biphenyl	9 ~~10~~	U
91-58-7	2-Chloronaphthalene	9 ~~10~~	U
88-74-4	2-Nitroaniline	23 ~~25~~	U
131-11-3	Dimethylphthalate	9 ~~10~~	U
606-20-2	2,6-Dinitrotoluene	~~10~~	U
208-96-8	Acenaphthylene	~~10~~	U
99-09-2	3-Nitroaniline	23 ~~25~~	U
83-32-9	Acenaphthene	9 ~~10~~	U

CAE 11/15/02

1D

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SW03PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-4

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RU1067-4A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/23/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	23 ~~25~~	U
100-02-7	4-Nitrophenol	23 ~~25~~	U
132-64-9	Dibenzofuran	9 ~~10~~	U
121-14-2	2,4-Dinitrotoluene	~~10~~	U
84-66-2	Diethylphthalate	~~10~~	U
86-73-7	Fluorene	~~10~~	U
7005-72-3	4-Chlorophenyl-phenylether	~~10~~	U
100-01-6	4-Nitroaniline	23 ~~25~~	U
534-52-1	4,6-Dinitro-2-methylphenol	23 ~~25~~	U
86-30-6	N-nitrosodiphenylamine (1)	9 ~~10~~	U
101-55-3	4-Bromophenyl-phenylether	~~10~~	U
118-74-1	Hexachlorobenzene	~~10~~	U
1912-24-9	Atrazine	~~10~~	U
87-86-5	Pentachlorophenol	23 ~~25~~	U
85-01-8	Phenanthrene	9 ~~10~~	U
120-12-7	Anthracene	~~10~~	U
86-74-8	Carbazole	~~10~~	U
84-74-2	Di-n-butylphthalate	~~10~~	U
206-44-0	Fluoranthene	~~10~~	U
129-00-0	Pyrene	~~10~~	U
85-68-7	Butylbenzylphthalate	~~10~~	U
91-94-1	3,3'-Dichlorobenzidine	~~10~~	U
56-55-3	Benzo(a)anthracene	~~10~~	U
218-01-9	Chrysene	~~10~~	U
117-81-7	bis(2-Ethylhexyl)phthalate	~~10~~	U
117-84-0	Di-n-octylphthalate	~~10~~	U
205-99-2	Benzo(b)fluoranthene	~~10~~	U
207-08-9	Benzo(k)fluoranthene	~~10~~	U
50-32-8	Benzo(a)pyrene	~~10~~	U
193-39-5	Indeno(1,2,3-cd)pyrene	~~10~~	U
53-70-3	Dibenzo(a,h)anthracene	~~10~~	U
191-24-2	Benzo(g,h,i)perylene	~~10~~	U

(1) - Cannot be separated from Diphenylamine

QE 11/12/02

1G

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SW03PB

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix: (soil/water) WATER Lab Sample ID: RU1067-4

Sample wt/vol: 1100 (g/mL) ML Lab File ID: RU1067-4A66

Level: (low/med) LOW Date Received: 09/19/02

% Moisture: _____ Decanted: (Y/N)___ Date Extracted:09/20/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 09/23/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Extraction: (Type) CONT

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

DATA VALIDATION

FOR

MARION BRAGG LANDFILL
MARION, INDIANA

WET CHEMISTRY ANALYSIS DATA
Total Suspended Solids,
Chloride, and Ammonia-Nitrogen in Water

Sample Delivery Group Nos. RU1067 and RW1067
September 2002 Sample Collections

Chemical Analyses Performed by:

CompuChem Environmental
Cary, North Carolina

FOR

O & M, Inc.
Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, TN 37922
(865) 966-8880

November 12, 2002

92241/CAE/EKD
\MARION\Sept02\WetChem

EXECUTIVE SUMMARY

Validation of the wet chemistry analysis data (total suspended solids [TSS], ammonia-nitrogen [ammonia], and chloride) prepared by CompuChem Environmental for 14 water samples and one field blank from the Marion Bragg Landfill Site in Marion, Indiana, has been completed by Trillium, Inc. The data were issued by the laboratory in two separate data packages, under Sample Delivery Group (SDG) Nos. RU1067 and RW1067, which were received for review on October 4, 2002, with additional information provided on October 31 and November 6 and 11, 2002. The following field samples were reported:

SDG No. RW1067:

GW08PB (MB-1)	GW08DPPB (MB-1D)	GW07PB (MB-2)
GW03PB (MB-5)	GW04PB (MB-6)	GW05PB (MB-7)
GW06PB (MB-8)	GW02PB (MB-9)	GW01PB (MB-10)
GW09FBPB (Field Blank)		

SDG No. RU1067:

PW01PB (PW-1)	SW01PB (SW-1)	SW01DPPB (SW-1D)
SW02PB (SW-5)	SW03PB (SW-6)	

Based on the validation effort, the sample results were qualified or corrected as follows:

- Results for ammonia in SW01PB and SW01DPPB were rejected (R).
- The positive results for ammonia in GW07PB, GW03PB, GW04PB, GW05PB, GW06PB, and GW02PB were rounded to reflect two significant figures.
- The positive results for TSS in GW08PB, GW08DPPB, PW01PB, SW01PB, SW01DPPB, and SW03PB were rounded to reflect two significant figures.
- Reporting Limits for ammonia, chloride, and TSS were adjusted to reflect two significant figures.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section X). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section IX.

This validation report should be considered part of both data packages for all future distributions of the wet chemistry data.

INTRODUCTION

Analyses for the requested parameters were performed by the laboratory according to the following analytical methods:

Ammonia - EPA 350.1
Chloride - EPA 300.0
Total Suspended Solids (TSS) - EPA 160.2

These methods are found in "Methods for Chemical Analysis of Water and Wastes," EPA 600/4-79/020, Rev. 3/83.

Since no validation guidelines specific to the analytical methods used are available, the validation was based on the requirements of the referenced procedures, the specifications of the project-specific Quality Assurance Project Plan (QAPP) and best professional judgment. The validation approach was similar to that described in USEPA's "National Functional Guidelines for Inorganic Data Review" (EPA-540/R-94/013, February 1994).

The data validation process is intended to evaluate data on a technical basis rather than a contract or method compliance basis. An initial assumption is that each data package contains sufficient raw data documentation to facilitate the validation process, comparable to the level of documentation required in a Contract Laboratory Program (CLP) data package.

During the validation process, laboratory data are verified against all available supporting documentation. Based on the findings of this review, qualifier codes may be added by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes in accordance with EPA's validation guidelines:

U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

R - The data are unusable. (Note: Analyte may or may not be present.)

J - The associated value is an estimated quantity.

UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

These codes are recorded on the customized data tables in Attachment A and the Classical Chemistry Analyses Data Sheets (Form Is) in Attachment B to qualify the results as appropriate according to the review of the data packages.

Two facts should be noted by all data users. First, **the "R" qualifier means that the laboratory-reported value is unusable.** In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, **no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable.** Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.

I. Holding Times, Preservation and Sample Integrity

The samples were collected 9/17-18/02. Analyses for all parameters were conducted within the holding times specified by the referenced methods and the QAPP (28 days from collection for chloride and ammonia; seven days from collection for TSS).

Physical preservation of all samples with ice was documented by the sampler on both applicable chain of custody (COC) records, and acceptable cooler temperatures (4.0-6.0°C; QC 4°C ±2°C) on laboratory receipt were also documented on each of the COCs.

Chemical preservation of the samples for ammonia analysis with sulfuric acid was also clearly documented on the COC records. However, no pHs were recorded by the laboratory on the COCs and no pH values were entered in the pH column on either of the laboratory's receiving logs. At the request of the validator, the laboratory provided corrected receiving logs via facsimile on 10/31/02. The corrected receiving log for SDG No. RU1067 showed pHs of <2 for all samples intended for ammonia analysis and was, therefore, acceptable. However, the "corrected" receiving log for SDG No. RW1067 indicated pHs of ">9" for all of the samples intended for ammonia analysis. This is incorrect. In response to the validator's second request, the laboratory provided a properly corrected receiving log for SDG No RW1067 via UPS on 11/11/02; this record appropriately showed pHs <2 for all samples intended for ammonia analysis, and no further action was necessary.

II. Calibrations

All samples were analyzed for chloride on 9/25-26/02. An initial calibration incorporating a blank and six standards at concentrations ranging from 0.1 mg/L to 50 mg/L was performed on 9/18/02 and documented in the data package. The reported correlation coefficient for the linear regression describing the best-fit curve was acceptable (>0.995) but could not be reproduced exactly by the validator, likely due to the weighting factor used by the laboratory. No action was necessary on this basis. ICV/CCV standards were run at appropriate frequencies during both chloride analysis series and all showed acceptable (QC 85-115%) recoveries relative to reported true values (94.7-106%).

The samples were analyzed for ammonia on 9/27/02; two calibration curves, each incorporating a blank and seven standards at concentrations ranging from 0.1 mg/L to 8 mg/L, were documented for this date. The reported correlation coefficient for the linear regression describing the best-fit curve for each IC was acceptable (>0.995) and was verified by the validator. ICV/CCV standards were run at appropriate frequencies during both ammonia analysis series and showed acceptable (QC 85-115%) recoveries relative to reported true values (101-110%). However, since only final results are displayed in the raw data documentation (i.e., absorbance values are not provided), these results cannot be verified by the validator.

Calibration is not applicable to the weight measurements used to determine TSS.

III. Blanks

No contamination was reported in any of the method blanks associated with the sample analyses; these results are supported by the raw data available in the data packages.

A field blank (GW09FBPB) was submitted for analysis with this set of site samples. No target analytes were detected in the field blank.

IV. Laboratory Control Samples

Laboratory control samples prepared and analyzed with the samples for all three analysis parameters showed acceptable recoveries (Lab QC 85-115%), ranging from 97.2-110%.

V. Laboratory Duplicate Analysis

No laboratory duplicate analyses were performed for any of the wet chemistry analysis parameters on any of the samples in this data set.

VI. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD analyses were performed on sample SW01PB for ammonia and chloride. Recoveries for ammonia (108% and 101%) and chloride (104% and 104%) were acceptable and showed excellent reproducibility, with RPDs of 6.5% and 0.4%, respectively (QC 80-120% Recovery and ≤20 RPD).

It must be noted that the responses for chloride in both spiked sample analyses exceeded the upper limit of the established calibration range. No dilutions were performed by the laboratory. Since both responses were less than 15% above the concentration of the highest calibration standard, no action was taken by the validator on this basis. However, the laboratory should be requested to appropriately dilute and re-analyze all samples that fall outside the established calibration range.

Although requested on the COC records, no MS/MSD analyses were performed on sample GW08PB for any of the wet chemistry analysis parameters. According to the laboratory, this was due to a scheduling error (see Attachment C).

VII. Field Duplicates

Samples GW08PB and GW08DPPB were identified as a field duplicate pair. Positive paired results showed acceptable reproducibility (QAPP QC ≤25 RPD) for chloride (1.5 RPD) and TSS (23 RPD). Ammonia was not detected above the RL in either sample analysis, therefore no quantitative evaluation of precision could be made for this parameter using these data.

Samples SW01PB and SW01DPPB were also identified as a field duplicate pair. Positive paired results showed good reproducibility for chloride (4.9 RPD) and TSS (19 RPD). Ammonia was not detected above the RL in SW01PB (0.10 U) but was found at 0.24 mg/L in SW01DPPB. Results for ammonia in SW01PB and SW01DPPB were rejected (R) as unreliable on this basis.

VIII. Sample Results Verification

Results for TSS and chloride were correctly calculated and accurately reported for the samples in this data set based on review of the available raw data. Ammonia results were correctly transcribed from the raw data; since only direct readings of the final results were documented, no verification of the reported concentrations could be made by the validator.

Sample results and RLs were reported to inconsistent significant figures and are not in accordance with previously-defined CompuChem policy, which states that values greater than 10 are reported to three significant figures and values less than 10 are reported to two significant figures. For consistency with historical data generated in support of this project, all results greater than or equal to 10 mg/L were adjusted to reflect three significant figures and values less than 10 mg/L (including RLs) were adjusted to reflect two significant figures, where necessary. Specifically, the following actions were taken:

- The positive results for ammonia in GW07PB, GW03PB, GW04PB, GW05PB, GW06PB, GW02PB, and SW01DPPB were rounded to reflect two significant figures because each value is less than 10 mg/L and was reported to three significant figures by the laboratory.

- The positive results for TSS in GW08PB, GW08DPPB, PW01PB, SW01PB, SW01DPPB, and SW03PB were rounded to reflect two significant figures because these values are less than 10 mg/L and were reported to three significant figures by the laboratory.

- RLs for ammonia, chloride, and TSS were adjusted to reflect two significant figures (instead of three, as reported by the laboratory).

The data tables in Attachment A list all individual sample analyte results, whether or not the value or qualifier was changed as a result of the validation effort.

IX. Documentation

Two chain of custody (COC) records were present in both data packages and included all reported samples. The following issues were noted:

- Sample PW01PB was not recorded by the sampler on either of the COCs. An appropriate notation to this effect was made by the laboratory on COC #061476.

- A second, facsimile copy of COC #061476 was also included in both data packages. The facsimile was signed by the same person and showed the same date/time of laboratory receipt as the "original." However, the two signatures are not identical and the facsimile does not contain two laboratory notations regarding sample condition on laboratory receipt that are on the "original." No explanation for this additional copy of one of the COC records was provided by the laboratory.

- Despite a specific request on the COCs, sample pHs on laboratory receipt were not recorded on either of the COCs.

- Copies of courier airbills were not included in either data package to document the shipment portion of the sample transfers. Airbill numbers, however, were documented on both of the COC records.

- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should not be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are laboratory-initiated quality control; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

The laboratory receiving logs in the data packages received for review did not include sample pH values measured on receipt at the laboratory. At the validator's request, corrected receiving logs were provided via facsimile by the laboratory on 10/31/02. However, the pHs recorded for the ammonia samples on the receiving log for SDG No. RW1067 (>9) were incorrect. The laboratory was contacted a second time, and a properly corrected receiving log for RW1067 was received via UPS on 11/11/02. The properly corrected documents were inserted into the data package for SDG #RU1067 as pages 109 and 110 and into the data package for SDG #RW1067 as pages 95 and 95A by the validator.

For ammonia, absorbance readings were provided for the IC standards but only direct readings of the final results were documented in the raw data for all runs performed during the sample analysis series. Therefore, no verification of the concentrations reported for these analyses could not be verified by the validator. At the discretion of the data user, the laboratory may be requested to provide this documentation in future data packages prepared in support of this project.

The true values for chloride in the ion chromatography ICV/CCV standards and for ammonia in the ICV standard were not documented in the data package. These values were provided by the laboratory via facsimile on 10/28/02 in conjunction with a comparable request related to validation of unrelated data for the same parameters (see Attachment C), and the same values were used to evaluate the data in these data packages.

The sample results on the spike and spike duplicate summary forms were inconsistently reported from the raw data. Specifically, on both forms, the unspiked sample result was corrected for the 5-fold dilution but the spiked sample result was not. At the request of the validator, the laboratory provided corrected summary forms, which were inserted into the data package for SDG No. RU1067 by the validator, replacing pages 8-10.

A corrected run log for the 9/26/02 ion chromatography analysis series for chloride was provided by the laboratory via facsimile on 11/6/02. This log was corrected to accurately reflect the dilution factors for each analysis relevant to this data set. The corrected page was inserted into the data package for SDG No. RW1067 by the validator, replacing the originally-provided page 26.

Most of these documentation issues do not directly affect the technical validity of the data generated for these samples, however some of them could be problematic if the data were to be used in litigation.

X. Overall Assessment

Sample results for the three wet chemistry parameters were qualified or corrected as follows based on the validation effort:

- Results for ammonia in SW01PB and SW01DPPB were rejected (R) as unreliable due to lack of confirmation in the field duplicate analyses.
- The positive results for ammonia in GW07PB, GW03PB, GW04PB, GW05PB, GW06PB, GW02PB, and SW01DPPB were rounded to reflect two significant figures because each value is less than 10 mg/L and was reported to three significant figures by the laboratory.

- The positive results for TSS in GW08PB, GW08DPPB, PW01PB, SW01PB, SW01DPPB, and SW03PB were rounded to reflect two significant figures because these values are less than 10 mg/L and were reported to three significant figures by the laboratory.

- RLs for ammonia, chloride, and TSS were adjusted to reflect two significant figures (instead of three, as reported by the laboratory).

Documentation issues are discussed in Section IX.

This validation report should be considered part of both data packages for all future distributions of the wet chemistry data.

TRILLIUM INC.

ATTACHMENT A

DATA TABLES

Wet Chemistry - SDG Nos. RU1067 and RW1067
September 2002 Sample Collections - Marion Bragg Landfill

Marion Bragg Landfill - September 2002 - Wet Chemistry Parameters in GW and SW

Results are in mg/L

Collection Point		MB-1	MB-1D	MB-2	MB-5	MB-6	MB-7	MB-8	MB-9
Sample ID		GW08PB	GW08DPPB	GW07PB	GW03PB	GW04PB	GW05PB	GW06PB	GW02PB
Lab Sample No.		RW1067-8	RW1067-9	RW1067-7	RW1067-3	RW1067-4	RW1067-5	RW1067-6	RW1067-2
Collection Date	RL	9/18/02	9/18/02	9/18/02	9/18/02	9/18/02	9/18/02	9/18/02	9/18/02
Ammonia	0.10	0.10 U	0.10 U	7.3	4.1	3.8	6.8	5.3	0.52
Chloride	4.0	20.6	20.3	18.9	16.7	13.2	23.6	27.3	12.0
Total Suspended Solids	1.0	7.8	6.2	12.4	16.6	22.6	31.2	44.8	52.8

Marion Bragg Landfill - September 2002 - Wet Chemistry Parameters in GW and SW

Results are in mg/L

Collection Point		MB-10	Field Blank	PW-1	SW-1	SW-1D	SW-5	SW-6
Sample ID		GW01PB	GW09FBPB	PW01PB	SW01PB	SW01DPPB	SW02PB	SW03PB
Lab Sample No.		RW1067-1	RW1067-10	RU1067-5	RU1067-1	RU1067-2	RU1067-3	RU1067-4
Collection Date		9/18/02	9/18/02	9/17/02	9/17/02	9/17/02	9/17/02	9/17/02
	RL							
Ammonia	0.10	0.10 U	0.10 U	0.10 U	R	R	0.10 U	0.10 U
Chloride	4.0	23.0	2.0 U	21.4	75.1	78.5	79.3	41.7
Total Suspended Solids	1.0	70.2	1.0 U	9.6	9.9	8.2	13.6	1.0

TRILLIUM INC.

ATTACHMENT B

CLASSICAL CHEMISTRY ANALYSES DATA SHEETS (FORM Is)

Wet Chemistry - SDG Nos. RU1067 and RW1067
September 2002 Sample Collections - Marion Bragg Landfill

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

GW08PB MB-1 CAE 11/7/02

Lab Name: CompuChem Contract: MARION BRAGG

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: RW1067

Matrix (soil/water): WATER Lab Sample ID: RW1067-8

Date Received: 9/19/02 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Chloride	20.6				9/26/02
TSS	7.8 ~~7.80~~				9/23/02
Ammonia	0.10 ~~0.100~~	U			9/27/02

CAErikson 11/8/02

Comments:

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

GW08DPPB
MB-1D
CAE 11/7/02

Lab Name: CompuChem Contract: MARION BRAGG

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: RW1067

Matrix (soil/water): WATER Lab Sample ID: RW1067-9

Date Received: 9/19/02 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	6.2 ~~6.20~~				9/23/02
Chloride	20.3				9/26/02
Ammonia	0.10 ~~0.100~~	U			9/27/02

CAE 11/8/02

Comments:

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

GW07PB MB-2

ab Name: CompuChem Contract: MARION BRAGG

Lab Code: LIBRTY Case No.: NRAS No.:

CAE 11/7/02

)G No.: RW1067

Matrix (soil/water): WATER Lab Sample ID: RW1067-7

ate Received: 9/19/02 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Chloride	18.9				9/26/02
TSS	12.4				9/23/02
Ammonia	7.3 ~~7.30~~				9/27/02

CAE 11/8/02

Comments:

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

GW03PB MB-5

b Name: CompuChem Contract: MARION BRAGG

ab Code: LIBRTY Case No.: NRAS No.: CAE 11/7/02

G No.: RW1067

latrix (soil/water): WATER Lab Sample ID: RW1067-3

te Received: 9/19/02 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Chloride	16.7				9/26/02
TSS	16.6				9/23/02
Ammonia	4.1 ~~4.10~~				9/27/02

CAE 11/7/02

Comments:

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

GW04PB MB-6

Lab Name: CompuChem Contract: MARION BRAGG

Lab Code: LIBRTY Case No.: NRAS No.: CAE 11/7/02

SDG No.: RW1067

Matrix (soil/water): WATER Lab Sample ID: RW1067-4

Date Received: 9/19/02 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Chloride	13.2				9/26/02
TSS	22.6				9/23/02
Ammonia	3.8 ~~3.78~~				9/27/02

CAE 11/7/02

Comments:

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

GW05PB MB-7

ab Name: CompuChem Contract: MARION BRAGG

Lab Code: LIBRTY Case No.: NRAS No.: CAE 11/7/02

SDG No.: RW1067

Matrix (soil/water): WATER Lab Sample ID: RW1067-5

Date Received: 9/19/02 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Chloride	23.6				9/26/02
TSS	31.2				9/23/02
Ammonia	6.8 ~~6.79~~				9/27/02

CAE 11/8/02

Comments:

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

GW06PB MB-8

ab Name: CompuChem Contract: MARION BRAGG

Lab Code: LIBRTY Case No.: NRAS No.: CAE 11/7/02

DG No.: RW1067

Matrix (soil/water): WATER Lab Sample ID: RW1067-6

ate Received: 9/19/02 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Chloride	27.3				9/26/02
TSS	44.8				9/23/02
Ammonia	5.3 ~~5.33~~				9/27/02

CAE 11/7/02

Comments:

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

GW02PB MB-9

CAE 11/7/02

) Name: CompuChem Contract: MARION BRAGG

ab Code: LIBRTY Case No.: NRAS No.:

3 No.: RW1067

atrix (soil/water): WATER Lab Sample ID: RW1067-2

te Received: 9/19/02 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Chloride	12.0				9/26/02
TSS	52.8				9/23/02
Ammonia	0.52 ~~0.525~~				9/27/02

CAE 11/7/02

Comments:

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

GW01PB MB-10

b Name: CompuChem Contract: MARION BRAGG

Lab Code: LIBRTY Case No.: NRAS No.: CAE 11/7/02

G No.: RW1067

Matrix (soil/water): WATER Lab Sample ID: RW1067-1

te Received: 9/19/02 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Chloride	23.0				9/26/02
TSS	70.2				9/23/02
Ammonia	0.10 ~~0.100~~	U			9/27/02

CAE 11/7/02

Comments:

2

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

GW09FBPB
Field Blank

ab Name: CompuChem Contract: MARION BRAGG

Lab Code: LIBRTY Case No.: NRAS No.:

CAE 11/7/02

)G No.: RW1067

Matrix (soil/water): WATER Lab Sample ID: RW1067-10

ate Received: 9/19/02 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	1.0 ~~1.00~~	U			9/23/02
Chloride	2.0 ~~2.00~~	U			9/26/02
Ammonia	0.10 ~~0.100~~	U			9/27/02

CAE 11/8/02

Comments:

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

PW01PB

PW-1

CAE 11/7/02

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: RU1067

Matrix (soil/water): WATER Lab Sample ID: RU1067-5

Date Received: 9/19/02 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	9.6 ~~0.60~~				9/23/02
Chloride	21.4				9/25/02
Ammonia	0.10 ~~0.100~~	U			9/27/02

CAE 11/8/02

Comments:

000 2

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

SW01PB

SW-1

b Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.: CAE 11/7/02

SG No.: RU1067

Matrix (soil/water): WATER Lab Sample ID: RU1067-1

Date Received: 9/19/02 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Ammonia	R ~~0.100~~	~~U~~			9/27/02
Chloride	75.1				9/25/02
TSS	9.9 ~~0.90~~				9/23/02

CAE 11/8/02

Comments:

0004

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

SW01DPPB
SW-1D

ab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.: CAE 11/7/02

DG No.: RU1067

Matrix (soil/water): WATER Lab Sample ID: RU1067-2

ate Received: 9/19/02 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	~~8.2~~ ~~8.20~~				9/23/02
Chloride	78.5				9/25/02
Ammonia	R ~~0.235~~				9/27/02

CAE 11/7/02

Comments:

10 3

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

SW-5 SW02PB

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: RU1067

Matrix (soil/water): WATER Lab Sample ID: RU1067-3

Date Received: 9/19/02 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	13.6				9/23/02
Chloride	79.3				9/25/02
Ammonia	0.10 ~~0.100~~	U			9/27/02

CAE 11/8/02

CAE 11/7/02

Comments:

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

SW03PB

SW-6

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: RU1067

Matrix (soil/water): WATER Lab Sample ID: RU1067-4

Date Received: 9/19/02 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
TSS	1.0 ~~1.00~~				9/23/02
Chloride	41.7				9/25/02
Ammonia	0.10 ~~0.100~~	U			9/27/02

Cae 11/8/02

Cae 11/7/02

Comments:

000006

TRILLIUM INC.

ATTACHMENT C

DATA ISSUES: VALIDATOR QUESTIONS AND LABORATORY RESPONSES CHLORIDE AND AMMONIA TRUE VALUES, AS PROVIDED FOR SDG #N1053

Wet Chemistry - SDG Nos. RU1067 and RW1067
September 2002 Sample Collections - Marion Bragg Landfill

Re: RU1067 & RW1067 inquiry

1. Yes, the GW samples were also diluted by a factor of five. An amended copy of the run log is included.

2. It is correct that the %Rs for the chloride are based on the uncorrected sample results. There has been some differences between analysts as to the procedure used for doing the QC. The proper way should be to spike and then dilute. All analysts running this method have recently been instructed as to the proper method and this error should not occur in the future. Corrected forms have been provided.

3. The duplicate forms were reported with the incorrect dilution-corrected values. The corrected forms are provided.

4. The QC was not analyzed on GW08 due to a laboratory scheduling error. The laboratory error was in not scheduling the QC as required, therefore the analysts did not know to run the QC as required.

Carol Erikson

From: "Carol Erikson" <cerikson@trilliuminc.com>
To: "Rodney Raimonde" <rraimonde@compuchemlabs.com>
Sent: Thursday, October 31, 2002 10:18 AM
Subject: Marion Bragg - RU1067/RW1067

Rodney -

In the chloride data:

Only the "SW-" and "PW-" samples are noted in the run log as having been run at 5-fold dilutions. Please confirm that the "GW-" samples were similarly diluted.

The values on the MS/MSD summary forms are inconsistently reported from the raw data ... the unspiked sample result is corrected for the 5-fold dilution on both forms, but the spiked sample result is not. The reported %Rs are based on 40 mg/L spike added and the uncorrected (i.e., as measured) sample concentrations. This is different from how the chloride spikes worked in the LDI data package (#N1053), where the 40 mg/L spike added amount was compared to the dilution-corrected sample concentrations. Please explain, and provide corrected summary forms as appropriate.

The values on the DUP summary form are also inconsistently reported - one value is dilution-corrected, the other is not. Please provide a corrected summary form.

In general for the wet chemistry parameters ... why was GW08 not run as a spike and spike duplicate?

Thanks.

Carol Erikson
Trillium, Inc.
cerikson@trilliuminc.com
865/966-8880
865/966-8885 fax

Carol Erikson

From: "Carol Erikson" <cerikson@trilliuminc.com>
To: "Rodney Raimonde" <rraimonde@compuchemlabs.com>
Sent: Thursday, October 31, 2002 9:15 AM
Subject: Marion Bragg - RU1067 and RW1067

Hi, Rodney -

I'm back onto the Marion Bragg data - can you give me an update on where you are with the sample pH documentation I requested? Also, can you explain why there is a fax copy (as well as a "regular" copy) of one of the chain of custody records in each of the data packages for this project?

Also - I'm going to assume that the ICV true value for ammonia and the ICV/CCV true values for chloride in this data package are the same as they were for the LDI data package that I just finished ..... right???

Thanks.
Carol

Carol Erikson
Trillium, Inc.
cerikson@trilliuminc.com
865/966-8880
865/966-8885 fax

Re: N1053:

1. Ammonia ICV TV = 6.03 (same sol'n as LCSW)

2. Incorrect spreadsheet used to process data. See attached amended run log. Summary forms are correct.

3.

	ICV TV	CCV TV
Chloride	40.0 mg/L	25.0 mg/L
Sulfate	40.0 mg/L	50.0 mg/L
Nitrate	1.00 mg/L	2.50 mg/L
Nitrite	1.00 mg/L	2.50 mg/L

4. Dilution factors were not consistently corrected as necessary on the run logs. All initial analyses are performed at a 5X dilution. Due to the low MDLs, we are able to maintain our RL with the 5X and improve the production on the IC. The summary run logs have been corrected for the dilution factors as necessary and are included.

5. The data reported for nitrate and nitrite for sample MW113 (as well as samples MW-1030 and MW-1050) was from the earlier run on 9/18/02. The chloride and sulfate was not reported from this analysis because the CCV and LCSW were not within acceptable ranges. Because of this, the instrument was recalibrated and the samples were reanalyzed. This is where the results from 9/19/02 came from. The nitrate and nitrite can not be reported from this analysis because it occurred after the required holding time.

6. See above (#5) for explaination.

7. See corrected summary run logs. The appropriate LCSW analyses are marked on the run logs. There was one value for nitrate that was changed for LCSW2. We realize these results are difficult to track, however, we are attempting to make certain the correct numbers are being reported for the LCS values for the associated results.

8. This page was apparently missed when the original raw data was copied. The raw data has been re-processed and the CCB results are attached.

10-28-02

DATA VALIDATION

FOR

MARION BRAGG LANDFILL
MARION, INDIANA

WET CHEMISTRY ANALYSIS DATA
Chemical Oxygen Demand (COD) in Water

CET Report Dated October 4, 2002
September 2002 Sample Collections

Chemical Analyses Performed by:

Chemical & Environmental Technology, Inc.
Research Triangle Park, North Carolina

FOR

O & M, Inc.
Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, TN 37922
(865) 966-8880

November 6, 2002

92241/CAE/ESC
\MARION\Sept02\cod

TRILLIUM INC.

EXECUTIVE SUMMARY

Validation of the wet chemistry analysis data (chemical oxygen demand [COD]) prepared by Chemical & Environmental Technology, Inc. (CET), under subcontract to CompuChem Environmental, for 14 water samples and one field blank from the Marion Bragg Landfill Site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in a single data package that had no identification number but was dated October 4, 2002. This data package was received for review on October 11, 2002, with additional documentation provided on October 24, 2002, and November 6, 2002. The following field samples were reported:

GW08PB (MB-1)	GW08DPPB (MB-1D)	GW07PB (MB-2)
GW03PB (MB-5)	GW04PB (MB-6)	GW05PB (MB-7)
GW06PB (MB-8)	GW02PB (MB-9)	GW01PB (MB-10)
GW09FBPB (Field Blank)	PW01PB (PW-1)	SW01PB (SW-1)
SW01DPPB (SW-1D)	SW02PB (SW-5)	SW03PB (SW-6)

Based on the validation effort, reported sample results were qualified or corrected as follows:

- The result for COD in SW01DPPB was qualified as less than the reported value (10.4 U).
- All sample results for COD (including reporting limits) were recalculated by the validator and reported to reflect three significant figures (rather than two, as reported by the laboratory).

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section IX). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section VIII.

This validation report should be considered part of the data package for all future distributions of the COD data.

INTRODUCTION

Analyses were performed according to EPA's "Chemical Analysis of Water and Wastes" (EPA-600/4-79-020), March 1983, Method 410.4. Since no guidelines specific to the analytical method used are available, the validation was based on the requirements of the referenced procedure, the specifications of the project-specific Quality Assurance Project Plan (QAPP), and best professional judgment. The validation approach was similar to that described in EPA's "National Functional Guidelines for Inorganic Data Review" (EPA-540/R-94/013, February 1994). Results of sample analyses were reported by the laboratory without qualifications.

The data validation process is intended to evaluate data on a technical basis rather than a contract or method compliance basis. An initial assumption is that the data package contains sufficient raw data documentation to facilitate the validation process, comparable to the level of documentation required in a Contract Laboratory Program (CLP) data package.

During the validation process, laboratory data are verified against all available supporting documentation. Based on this review, qualifier codes may be added by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes in accordance with EPA's National Functional Guidelines:

U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

R - The data are unusable. (Note: The analyte may or may not be present.)

J - The associated value is an estimated quantity.

UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

These codes are recorded on the client-customized data tables (Attachment A) and the laboratory's Analytical Reports (Attachment B) to qualify the results as appropriate according to the review of the data package.

Two facts should be noted by all data users. First, **the "R" qualifier means that the laboratory-reported value is unusable.** In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last

resort. Second, **no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable.** Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.

I. Holding Times, Preservation and Sample Integrity

The water samples were collected on 9/17-18/02. All COD analyses were conducted well within the 28-day holding time specified by both the referenced method and the QAPP.

An acceptable (4°C ±2°C) cooler temperature on receipt of the samples at CET (5°C) was recorded on the chain of custody (COC) records documenting the shipment of samples from CompuChem to CET. Preservation with sulfuric acid and ice was recorded on one of the two applicable COCs by CompuChem, but no documentation of sample pH on receipt at CET was found in the data package. However, the use of sulfuric acid and ice was documented on the field COCs (documenting shipment of the samples from the site to CompuChem) and verification of successful acidification of the COD sample containers was documented on CompuChem's receiving logs, all of which were provided in CompuChem's data packages for the other analysis parameters requested on these samples. Therefore, no action was taken on this basis.

II. Calibrations

The reported COD analyses were performed on 9/24/02 and 9/27/02. Raw data documentation of an initial calibration (IC) performed on 6/3/02 was provided on 10/24/02 at the validator's request; this date was recorded on the bench sheets for each analysis date, but it was not clear to what it referred until the raw IC data were received (see Attachment C).

The 6/3/02 IC was established using five standard concentrations ranging from 10 mg/L to 150 mg/L. The best-fit linear regression describing the calibration curve gave an acceptable correlation coefficient (>0.995) and was verified by the validator.

A check standard at 75 mg/L was run at the start of each COD analysis series. Acceptable recoveries (QC 85-115%) were reported (98% and 92%) and verified by the validator.

Raw data for a high range IC run on 6/3/02 were also provided by the laboratory on 10/24/02. However, this IC was not relevant to any of the reported sample analyses; therefore, it was not reviewed as part of this validation effort.

III. Blanks

A blank was run at the start and end of each COD analysis series. No absorbance response was documented for either of these blanks.

One field blank, GW09FBPB, was submitted with this sample set. COD was not detected above the laboratory-specified reporting limit (RL) of 10 mg/L in the field blank.

IV. Laboratory Control Samples (LCS)

No LCSs were run in association with these samples.

V. Laboratory and Field Duplicate Analyses

A. Laboratory Duplicates

GW08DPPB and PW01PB were each run in duplicate by the laboratory. COD was not detected above the RL in either analysis of GW08DPPB, therefore no quantitative evaluation of precision could be made using these data. Excellent reproducibility (0 relative percent difference, RPD) was demonstrated for COD in the duplicate analyses of PW01PB.

B. Field Duplicates

Sample GW08DPPB was identified as a field duplicate of GW08PB. COD was not detected above the laboratory-specified RL in either sample, therefore no quantitative evaluation of precision could be made using these data.

SW01DPPB was identified as a field duplicate of SW01PB. COD was reported at a very low concentration (10.4 mg/L) in SW01DPPB but was not detected (10.0 U) in SW01PB. The result for COD in SW01DPPB was qualified as less than the reported value (10.4 U) due to lack of confirmation in the field duplicate analyses.

VI. Matrix Spike Analysis

No matrix spike analyses were reported in this data package.

VII. Sample Results Verification

All sample results for COD were correctly calculated and accurately reported by the laboratory.

The laboratory-specified RL of 10 mg/L is equivalent to the low concentration standard used to establish the initial calibration, and is therefore supported by the data as presented.

All sample results were greater than or equal to 10 mg/L and were reported to two significant figures by the laboratory; this is consistent with the results as found on the bench sheets. However, the historical data generated in support of this project reflect three significant figures for results that are greater than or equal to 10.0 mg/L. Since raw data for the relevant IC were provided by the

laboratory, the sample results could be calculated by the validator and reported to three significant figures, where appropriate, for consistency with the historical project data. Positive results for COD in GW07PB, GW03PB, GW04PB, GW05PB, GW06PB, PW01PB, and SW01DPPB and the RLs for all remaining samples in this data set were so corrected by the validator.

The data tables in Attachment A list all individual sample analyte results, whether or not the value or qualifier was affected by the findings of the validation effort.

VIII. Documentation

Field-initiated COC records were not included in the COD data package, but were available in the CompuChem data packages for the other analysis parameters run on these samples. Two COC records documenting transfer of the samples from CompuChem to CET were present; all samples reported in this data set were listed on these forms. The following issues were noted:

- Sample pHs were not recorded on either of the COCs by CET on sample receipt.
- On COC #S11292, no preservation information was recorded by CompuChem.
- No courier information was documented, nor was a copy of the courier airbill (if applicable) included in the data package.
- On both COC records, the dates accompanying the first "Received by" CET signature and the subsequent "Relinquished by" CET signature were incomplete; no year was recorded.
- On COC #S11292, the collection date for the "SW-" samples appears to read "9/19/02," and this date was used by CET on their reporting forms. However, the field COCs in the CompuChem data packages indicate a collection date of 9/17/02 for these samples. No corrections were made to the interlaboratory COC by the validator, but the collection dates on the Final Reports of Analysis for the affected samples were corrected to 9/17/02 (from 9/19/02).

In their first response to the validator's request for missing IC raw data, the laboratory provided a second copy of the original COD data package on 10/16/02. In response to a repeated request for the same information, CET provided (through CompuChem) the appropriate raw data for the relevant IC. The IC raw data pages were inserted into the original data package by the validator.

In the data package as received for review, the 9/27/02 laboratory bench sheet indicates that absorbance was measured at 460 nm. On all other documentation in the data package, absorbance at 600 nm (as specified by the method) is recorded. At the request of the validator, the laboratory

provided a corrected bench sheet for the 9/27/02 analyses. This page was inserted into the data package by the validator.

These documentation issues do not directly affect the technical validity of the analytical data generated, but they could be problematic if the data were used in litigation.

IX. Overall Assessment

Based on the validation effort, reported sample results were qualified or corrected as follows:

- The result for COD in SW01DPPB was qualified as less than the reported value (10.4 U) due to lack of confirmation in the field duplicate analyses.
- All sample results for COD (including RLs) were recalculated by the validator and reported to reflect three significant figures (rather than two, as reported by the laboratory) for consistency with the historical data generated for this project.

Documentation issues are discussed in Section VIII.

This validation report should be considered part of the data package for all future distributions of the COD data.

TRILLIUM INC.

ATTACHMENT A

DATA TABLES
COD in Water
September 2002 Sample Collections - Marion Bragg Landfill
CET Report dated October 4, 2002

Marion Bragg Landfill - September 2002 - Chemical Oxygen Demand in Ground Water and Surface Water

Results are in mg/L

Collection Point ===>		MB-1	MB-1D	MB-2	MB-5	MB-6	MB-7	MB-8	MB-9
Sample ID ========>		GW08PB	GW08DPPB	GW07PB	GW03PB	GW04PB	GW05PB	GW06PB	GW02PB
Lab Sample No. ===>		200675	200676	200674	200680	200681	200672	200673	200679
Collection Date. ===>		9/18/02	9/18/02	9/18/02	9/18/02	9/18/02	9/18/02	9/18/02	9/18/02
	RL								
COD	10.0	10.0 U	10.0 U	21.3	10.4	16.9	25.6	64.8	10.0 U

Marion Bragg Landfill - September 2002 - Chemical Oxygen Demand in Ground Water and Surface Water

Results are in mg/L

Collection Point ===>		MB-10	Field Blank	PW-1	SW-1	SW-1D	SW-5	SW-6
Sample ID ========>		GW01PB	GW09FBPB	PW01PB	SW01PB	SW01DPPB	SW02PB	SW03PB
Lab Sample No. ===>		200678	200677	200686	200684	200685	200682	200683
Collection Date. ===>		9/18/02	9/18/02	9/17/02	9/17/02	9/17/02	9/17/02	9/17/02
	RL							
COD	10.0	10.0 U	10.0 U	21.3	10.0 U	10.4 U	10.0 U	10.0 U

TRILLIUM INC.

ATTACHMENT B

ANALYTICAL REPORTS
COD in Water
September 2002 Sample Collections - Marion Bragg Landfill
CET Report dated October 4, 2002

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200675 SAMPLE ID- GW08PB MB-1
DATE SAMPLED- 09/18/02
DATE RECEIVED- 09/19/02 SAMPLER- CLIENT CAE 11/6/02
TIME RECEIVED- 1605 DELIVERED BY- CHRIS BRAND

SAMPLE MATRIX- GW
TIME SAMPLED- 1230
RECEIVED BY- ALT

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	09/24/02	JMB	<10 mg/L ~~<10.0~~	10

CAE 11/6/02

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR _____

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090

Shipping: 102-A Woodwinds Industrial Court • Cary, NC 27511
Fax (919) 467-3515

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200676 SAMPLE ID- GW08DPPB MB-1D
DATE SAMPLED- 09/18/02
DATE RECEIVED- 09/19/02 SAMPLER- CLIENT CAE 11/6/02
TIME RECEIVED- 1605 DELIVERED BY- CHRIS BRAND

SAMPLE MATRIX- GW
TIME SAMPLED- 1230
RECEIVED BY- ALT

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	09/24/02	JMB	<10.0 <10 mg/L	10

CAE 11/6/02

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A.L.K.

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090

Shipping 102-A Woodwinds Industrial Court • Cary, NC 27511
Fax (919) 467-3515

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200674 SAMPLE ID- GW07PB MB-2 CAE 11/6/02 SAMPLE MATRIX- GW
DATE SAMPLED- 09/18/02 TIME SAMPLED- 1145
DATE RECEIVED- 09/19/02 SAMPLER- CLIENT RECEIVED BY- ALT
TIME RECEIVED- 1605 DELIVERED BY- CHRIS BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	09/24/02	JMB	~~21~~ 21.3	mg/L	10

CAE 11/6/02

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A. L. H.

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090
Shipping: 102-A Woodwinds Industrial Court • Cary, NC 27511
Fax (919) 467-3515

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: *DIANE BYRD*
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200680 SAMPLE ID- GW03PB MB-5 SAMPLE MATRIX- GW
DATE SAMPLED- 09/18/02 CAE 11/6/02 TIME SAMPLED- 0850
DATE RECEIVED- 09/19/02 SAMPLER- CLIENT RECEIVED BY- ALT
TIME RECEIVED- 1605 DELIVERED BY- CHRIS BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	09/27/02	JMB	10.4 ~~10~~	mg/L	10

CAE 11/6/02

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A. L. M

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090

Shipping: 102-A Woodwinds Industrial Court • Cary, NC 27511
Fax (919) 467-3515

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200681 SAMPLE ID- GW04PB MB-6 SAMPLE MATRIX- GW
DATE SAMPLED- 09/18/02 TIME SAMPLED- 0930
DATE RECEIVED- 09/19/02 SAMPLER- CLIENT CAE 11/6/02 RECEIVED BY- ALT
TIME RECEIVED- 1605 DELIVERED BY- CHRIS BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	09/27/02	JMB	~~17~~ 16.9	mg/L	10

CAE 11/6/02

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A. L. H.

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090
Shipping: 102-A Woodwinds Industrial Court • Cary, NC 27511
Fax (919) 467-3515

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200672 SAMPLE ID- GW05PB MB-7 SAMPLE MATRIX- GW
DATE SAMPLED- 09/18/02 CAE 11/6/02 TIME SAMPLED- 1000
DATE RECEIVED- 09/19/02 SAMPLER- CLIENT RECEIVED BY- ALT
TIME RECEIVED- 1605 DELIVERED BY- CHRIS BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	09/24/02	JMB	25.6 ~~26~~	mg/L	10

CAE 11/6/02

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A. L. K

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090

Shipping: 102-A Woodwinds Industrial Court • Cary, NC 27511
Fax (919) 467-3515

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200673 SAMPLE ID- GW06PB MB-8 SAMPLE MATRIX- GW
DATE SAMPLED- 09/18/02 TIME SAMPLED- 1030
DATE RECEIVED- 09/19/02 SAMPLER- CLIENT CAE 11/6/02 RECEIVED BY- ALT
TIME RECEIVED- 1605 DELIVERED BY- CHRIS BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	09/24/02	JMB	64.8 ~~65~~	mg/L	10

CAE 11/6/02

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A. L. M.

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090
Shipping: 102-A Woodwinds Industrial Court • Cary, NC 27511
Fax (919) 467-3515

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200679 SAMPLE ID- GW02PB MB-9 SAMPLE MATRIX- GW
DATE SAMPLED- 09/18/02 TIME SAMPLED- 0815
DATE RECEIVED- 09/19/02 SAMPLER- CLIENT CAE 11/6/02 RECEIVED BY- ALT
TIME RECEIVED- 1605 DELIVERED BY- CHRIS BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	09/27/02	JMB	<10.0 ~~<10~~	mg/L	10

PQL = Practical Quantitation Limit CAE 11/6/02
Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A. L. M

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090

Shipping: 102-A Woodwinds Industrial Court • Cary, NC 27511
Fax (919) 467-3515

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200678 SAMPLE ID- GW01PB MB-10
DATE SAMPLED- 09/18/02
DATE RECEIVED- 09/19/02 SAMPLER- CLIENT CAE 11/6/02
TIME RECEIVED- 1605 DELIVERED BY- CHRIS BRAND

SAMPLE MATRIX- GW
TIME SAMPLED- 0940
RECEIVED BY- ALT

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	09/27/02	JMB	~~<10~~ <10.0	mg/L	10

CAE 11/6/02

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A. L. H.

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090

Shipping: 102-A Woodwinds Industrial Court • Cary, NC 27511
Fax (919) 467-3515

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200677 SAMPLE ID- GW09FBPB Field Blank
DATE SAMPLED- 09/18/02
DATE RECEIVED- 09/19/02 SAMPLER- CLIENT
TIME RECEIVED- 1605 DELIVERED BY- CHRIS BRAND

SAMPLE MATRIX- GW
TIME SAMPLED- 1410
RECEIVED BY- ALT

CAE 11/6/02

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	09/27/02	JMB	<10.0 ~~<10~~	mg/L	10

CAE 11/6/02

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A.L.H.

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090

Shipping: 102-A Woodwinds Industrial Court • Cary, NC 27511
Fax (919) 467-3515

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200686 SAMPLE ID- PW01PB PW-1 SAMPLE MATRIX- GW
DATE SAMPLED- 09/17/02 TIME SAMPLED- 1705
DATE RECEIVED- 09/19/02 SAMPLER- CLIENT CAE 11/6/02 RECEIVED BY- ALT
TIME RECEIVED- 1605 DELIVERED BY- CHRIS BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	09/27/02	JMB	21.3 ~~21~~	mg/L	10

CAE 11/6/02

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR _____

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090

Shipping: 102-A Woodwinds Industrial Court • Cary, NC 27511
Fax (919) 467-3515

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200684 SAMPLE ID- SW01PB SW-1 CAE 11/6/02 SAMPLE MATRIX- GW
DATE SAMPLED- ~~09/19/02~~ 9/17/02 CAE 10/30/02 TIME SAMPLED- 1615
DATE RECEIVED- 09/19/02 SAMPLER- CLIENT RECEIVED BY- ALT
TIME RECEIVED- 1605 DELIVERED BY- CHRIS BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	09/27/02	JMB	~~<10~~ <10.0	mg/L	10

PQL = Practical Quantitation Limit CAE 11/6/02
Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A.L.H

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090
Shipping: 102-A Woodwinds Industrial Court • Cary, NC 27511
Fax (919) 467-3515

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200685 SAMPLE ID- SW01DPPB SW-1D CAE 11/6/02 SAMPLE MATRIX- GW
DATE SAMPLED- ~~09/19/02~~ 9/17/02 CAE 10/30/02 TIME SAMPLED- 1615
DATE RECEIVED- 09/19/02 SAMPLER- CLIENT RECEIVED BY- ALT
TIME RECEIVED- 1605 DELIVERED BY- CHRIS BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	09/27/02	JMB	10.4 U ~~10~~	mg/L	10

CAE 11/6/02

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A. L. K

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090

Shipping: 102-A Woodwinds Industrial Court • Cary, NC 27511
Fax (919) 467-3515

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200682 SAMPLE ID- SW02PB SW-5 CAE 11/6/02 SAMPLE MATRIX- GW
DATE SAMPLED- ~~09/19/02~~ 9/17/02 CAE 10/30/02 TIME SAMPLED- 1500
DATE RECEIVED- 09/19/02 SAMPLER- CLIENT RECEIVED BY- ALT
TIME RECEIVED- 1605 DELIVERED BY- CHRIS BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	09/27/02	JMB	<10.0 ~~10~~	mg/L	10

CAE 11/6/02

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A. L. M

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090
Shipping: 102-A Woodwinds Industrial Court • Cary, NC 27511
Fax (919) 467-3515

CHEMICAL & ENVIRONMENTAL TECHNOLOGY, INC.

ENVIRONMENTAL ANALYTICAL SERVICES

FINAL REPORT OF ANALYSES

COMPUCHEM
Attn: DIANE BYRD
501 MADISON AVENUE
CARY, NC 27513-

REPORT DATE: 10/03/02

SAMPLE NUMBER- 200683 SAMPLE ID- SW03PB SW-6 CAE 11/6/02 SAMPLE MATRIX- GW
DATE SAMPLED- ~~09/19/02~~ 9/17/02 CAE 10/30/02 TIME SAMPLED- 1505
DATE RECEIVED- 09/19/02 SAMPLER- CLIENT RECEIVED BY- ALT
TIME RECEIVED- 1605 DELIVERED BY- CHRIS BRAND

Page 1 of 1 PROJECT NAME : MARION BRAGG

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT	UNITS	PQL
CHEMICAL OXYGEN DEMAND	EPA 410.4	09/27/02	JMB	<10.0 ~~<10~~	mg/L	10

CAE 11/6/02

PQL = Practical Quantitation Limit
Results followed by the letter J are estimated concentrations.

NC DENR CERTIFICATIONS: DWQ - 96; PUBLIC WATER SUPPLY - 37724

LABORATORY DIRECTOR A. L. K

P.O. Box 12298 • Research Triangle Park, NC 27709
Telephone (919) 467-3090
Shipping: 102-A Woodwinds Industrial Court • Cary, NC 27511
Fax (919) 467-3515

TRILLIUM INC.

ATTACHMENT C

EXAMPLE COD BENCH SHEET
COD in Water
September 2002 Sample Collections - Marion Bragg Landfill
CET Report dated October 4, 2002

Low COD

EPA Method 410.4

Date: 9/24/02
Time: 0922
Analyst:JMB
6/3/02

Lims Batch/ Sample Type	Sample #	Dilution Factor (ml)	Final Volume (ml)	Absorbance at 600nm	Result (mg/l)	% Recovery or RAPD	Digestion Time
	Blank	1	2	0.000	0.000		1016-1216
	Ck std 75mg/l	1	2	0.035	73.5	98%	
270035/GW	200433	1	2	0.015	30		
	200434	1	2	0.009	17		
	200435	1	2	0.009	17		
	200436	1	2	0.005	< 10		
	200505	1	2	0.011	21		
	200672	1	2	0.013	26		
	200673	1	2	0.031	65		
	200674	1	2	0.011	21		
	200675	1	2	0.002	< 10		
	200676	1	2	0.002	< 10		
	200676DUP	1	2	0.002	< 10	0%	
270034/WW	200694	1	2	0.023	47		

TRILLIUM INC.

DATA VALIDATION

FOR

MARION BRAGG LANDFILL
MARION, INDIANA

INORGANIC ANALYSIS DATA
Dissolved Metals in Water

SDG No. RW1067
Samples Collected September 2002

Chemical Analyses Performed by:

CompuChem Environmental
Cary, North Carolina

FOR

O & M, Inc.
Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, Tennessee 37922
(865) 966-8880

November 12, 2002

92241/CAE/DAS
MARION\Sept02\DMetals2

TRILLIUM INC.

EXECUTIVE SUMMARY

Validation of the inorganics analysis data (dissolved metals) prepared by CompuChem Environmental for nine water samples and one field blank from the Marion Bragg Landfill Site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in a single data package under Sample Delivery Group (SDG) No. RW1067, which were received for review on October 4, 2002, with additional information provided on October 28, 2002, and November 1 and 11, 2002. The following samples were reported:

GW08PB (MB-1)	GW08DPPB (MB-1D)	GW07PB (MB-2)
GW03PB (MB-5)	GW04PB (MB-6)	GW05PB (MB-7)
GW06PB (MB-8)	GW02PB (MB-9)	GW01PB (MB-10)
GW09FBPB (Field Blank)		

Findings of the validation effort resulted in the following qualifications of sample results:

- Results for nickel, selenium, silver, and sodium in all samples were qualified as estimated (J, UJ).
- Results for chromium, cobalt, and lead in all samples except GW06PB were qualified as estimated (J, UJ).
- Results for aluminum in GW08PB, GW01PB, GW02PB, GW03PB, GW04PB, GW05PB, GW07PB, GW08DPPB, and GW09FBPB were qualified as less than the reported values (U).
- Results for barium and magnesium in GW09FBPB were qualified as less than the reported values (U).
- The result for beryllium in GW06PB was qualified as less than the reported value (U).
- Results for manganese in GW01PB and GW09FBPB were qualified as less than the reported values (U).
- Results for copper in GW01PB, GW08PB, GW02PB, GW03PB, and GW04PB were qualified as estimated (UJ).
- The result for iron in GW01PB was qualified as estimated (UJ).

- Results for antimony, copper, and potassium in GW09FBPB were qualified as estimated (J, UJ).

- Results for zinc in GW08PB, GW08DPPB, GW07PB, GW03PB, GW04PB, GW05PB, GW02PB, and GW01PB were qualified as less than the reported values (U).

- Results for vanadium in GW08PB, GW08DPPB, GW07PB, GW03PB, GW04PB, GW05PB, GW02PB, GW01PB, and GW09FBPB were qualified as estimated (J, UJ).

- Results for antimony in GW08PB, GW07PB, GW03PB, GW04PB, and GW01PB were qualified as less than the reported values (U).

- Results for arsenic in GW08DPPB and GW02PB were qualified as estimated (J).

All "B" and "E" flags applied by the laboratory were removed by the validator.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section XIII). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section XII of this report.

This validation report should be considered part of the data package for all future distributions of the inorganics data.

INTRODUCTION

Analyses were performed according to the USEPA Contract Laboratory Program (CLP) Statement of Work ILM04.0. All target analytes (dissolved metals) were analyzed using trace ICP (inductively coupled plasma) and cold vapor atomic absorption (CVAA) instrumentation. Results of analyses are reported by the laboratory as either qualified or unqualified; various qualifier codes denote specific information regarding the analytical results.

Trillium's validation was performed in accordance with the EPA "National Functional Guidelines for Inorganic Data Review" (EPA 540/R-94/013, 2/94). The EPA Region II Standard Operating Procedure (SOP) No. HW-2, (Revision XI), January 1992, "Evaluation of Metals Data for the Contract Laboratory Program (CLP)" was also used as guidance for the validation effort, and professional judgment was applied as necessary and appropriate.

The data validation process is intended to evaluate data on a technical basis rather than a contract compliance basis for chemical analyses conducted under the CLP. An initial assumption is that each data package is presented in accordance with the CLP requirements. It is also assumed that each data package represents the best efforts of the laboratory and has already been subjected to adequate and sufficient quality review prior to submission for validation.

During the validation process, laboratory data are verified against all available supporting documentation. Based on the review, qualifier codes may be added, deleted, or modified by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes as defined by the National Functional Guidelines:

U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

R - The data are unusable. (Note: The analyte may or may not be present.)

J - The associated value is an estimated quantity.

UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

These codes are recorded on the customized data tables contained in Attachment A as well as on the Inorganic Analysis Data Sheets (Form Is) in Attachment B of this validation report to qualify the results as appropriate according to the review of the data package.

Two facts should be noted by all data users. First, **the "R" qualifier means that the laboratory-reported value is unusable.** In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, **no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable.** Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.

I. Holding Times, Preservation and Sample Integrity

The ground water samples and field blank were collected 9/18/02. All metals analyses were conducted on 9/25/02, which is well within acceptable holding times (28 days for mercury and six months for all other analytes).

Field filtration of the ground water samples for dissolved metals analysis was not clearly documented by the sampling team on the applicable chain of custody (COC) records. A "B" (for "both") was recorded on each COC in the field used to designate filtered or unfiltered; no clarification of what was filtered and unfiltered was documented. For the purposes of this validation effort, it was assumed that the appropriate sample containers for dissolved metals analysis were field-filtered prior to chemical preservation.

Chemical preservation of the ground water samples for dissolved metals analysis with nitric acid and ice was clearly documented on the COCs. Acceptable cooler temperatures (4-6°C) on laboratory receipt were recorded on both COCs and on the laboratory's receiving logs. Acceptable sample pHs (<2) were not documented on the COCs but were recorded on the applicable receiving and preparation logs. Therefore, successful sample preservation in the field was confirmed.

A sampler notation on one of the COCs indicated that sample GW09FBPB needed to be filtered and preserved in-house (i.e., at the laboratory). No further information regarding this specification was found in the data package as received for review. On request, the laboratory provided a Quality Assurance (QA) notice indicating that GW09FBPB was at pH 7 on laboratory receipt and that it was both filtered and chemically preserved to pH<2 by the laboratory. No further action was necessary.

According to the data package narrative, all samples were received intact and in good condition.

II. Calibrations

Sample analyses for all Trace ICP target elements were performed in a single analysis series on 9/25/02 on an instrument identified as "P4." Mercury analyses were performed in a single CVAA series run on 9/25/02 on an instrument identified as "V3." A linearity check at the start of the CVAA series gave an acceptable correlation coefficient (>0.995). Initial and continuing calibration verification (ICV/CCV) standards were satisfactory for all metals reported from both applicable analysis series (90-110% for all ICP target analytes and 80-120% for mercury).

Contract required detection limit (CRDL) standards were run at regular intervals throughout the ICP analysis series; all applicable analytes were at the required concentrations (2xCRDL). Recoveries were acceptable (80-120%) in the CRDL standards bracketing the sample analyses except for selenium (71.9%) in the mid-series CRDL standard and lead (77.5%) in the series-ending CRDL

standard. Since all of the samples were analyzed toward the end of the analysis series, results for selenium in all samples and for lead in all samples except GW06PB were qualified as estimated (UJ) based on the low CRDL standard recoveries. The result for lead in GW06PB was greater than four times the CRDL, therefore this result did not require qualification based on the low CRDL standard recovery.

A CRDL standard was also run at the start of the analysis series for mercury. The recovery for mercury in this standard (105%) was acceptable.

III. Blanks

No metals calibration blanks had values above the CRDLs or less than the negative CRDLs for any target element. However, responses above the applicable instrument detection limits (IDLs) were found for various combinations of 11 different elements (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, iron, magnesium, manganese, and potassium) in each of the initial and continuing calibration blanks (ICB/CCBs); in addition, results for one or more of 11 elements (cobalt, chromium, copper, iron, lead, nickel, potassium, selenium, silver, sodium, and vanadium) that were below the negative IDLs were also reported in each of the ICB/CCBs. Results for samples analyzed within five runs of an affected ICB/CCB warrant qualification if the sample result is less than five times the positive blank value or less than two times the absolute value of the negative blank value. The following sample results were qualified as less than the reported values (U) due to contamination in the associated calibration blanks:

- Aluminum in GW08PB, GW01PB, GW02PB, GW03PB, GW04PB, GW05PB, GW07PB, GW08DPPB, and GW09FBPB.
- Barium and magnesium in GW09FBPB.
- Beryllium in GW06PB.
- Manganese in GW01PB and GW09FBPB.

The result for arsenic in GW08DPPB warranted qualification as less than the reported value (8.2 U) due to the presence of arsenic in the associated CCB at 2.7 µg/L. However, based on other available quality control data and the validator's professional judgment, this qualifier was not applied. See Section IX for further discussion.

The following sample results were qualified as estimated (UJ) based on negative responses in the associated calibration blanks:

- Chromium, copper, and silver in GW01PB, GW08PB, GW02PB, GW03PB, and GW04PB.
- Iron in GW01PB.
- Potassium in GW09FBPB.
- Selenium in GW09FBPB, GW05PB, GW06PB, GW07PB, and GW08DPPB.

Sample results for all remaining elements for which positive or negative responses were found in the ICB/CCBs were not affected by the associated calibration blank values.

One preparation blank (PBW) was prepared and analyzed with the samples in this SDG. Responses for aluminum (18.62 µg/L), barium (0.29 µg/L), chromium (-0.83 µg/L), cobalt (-0.56 µg/L), magnesium (59.15 µg/L), nickel (-166.20 µg/L), silver (-0.53 µg/L), vanadium (-0.38 µg/L), and zinc (2.04 µg/L) were reported in the preparation blank. The following sample results were qualified as less than the reported values (U) based on associated preparation blank contamination:

- Aluminum in GW08PB, GW08DPPB, GW07PB, GW03PB, GW04PB, GW05PB, GW02PB, and GW01PB.
- Barium and magnesium in GW09FBPB.
- Zinc in GW08PB, GW07PB, GW03PB, GW04PB, GW05PB, GW02PB, and GW01PB.

The following sample results were qualified as estimated (J, UJ) due to negative responses in the preparation blank:

- Chromium and vanadium in GW08PB, GW08DPPB, GW07PB, GW03PB, GW04PB, GW05PB, GW02PB, GW01PB, and GW09FBPB.
- Cobalt in GW05PB, GW02PB, GW01PB, and GW09FBPB.
- Nickel and silver in all samples.

Some of the actions warranted based on PBW responses are redundant with actions taken based on ICB/CCB results; no additional action was taken in these cases.

One field blank, GW09FBPB, was prepared in association with this data set. After qualifications based on laboratory blank contamination, antimony (2.5 µg/L), calcium (609 µg/L), copper (1.1 µg/L), sodium (124 µg/L), and zinc (10.2 µg/L) were detected in this field-submitted

blank. Results for antimony in GW08PB, GW07PB, GW03PB, GW04PB, and GW01PB and for zinc in GW08PB, GW08DPPB, GW07PB, GW03PB, GW04PB, GW05PB, GW02PB, and GW01PB were qualified as less than the reported values (U) based on associated field blank contamination. No other sample results were affected by the field blank values.

IV. ICP Interference Check Sample

All interference check sample results were satisfactory (80-120 percent recovery).

V. Laboratory Control Sample

One laboratory control sample (LCS) was run for all ICP target analytes in association with this SDG. All laboratory control sample results for the ICP target analytes were satisfactory (80-120 percent recovery).

Based on the available documentation, no LCS samples were prepared or analyzed for mercury.

VI. Laboratory Duplicate Analysis

Duplicate analysis was performed on sample GW08PB for all target analytes. Relative percent differences (RPDs) between positive paired analytes in GW08PB and its duplicate were below the maximum acceptance limit of 20% for all elements detected at concentrations greater than five times the CRDL. For elements detected at concentrations less than five times the CRDL in the paired analyses, the difference between the paired results must be less than ±CRDL. This criterion was met for all applicable target analytes.

A positive result below the CRDL for lead was reported in the duplicate analysis (1.6 µg/L) but was not confirmed in the original analysis (1.3 U). Lead was also not detected in the field duplicate of GW08PB (GW08DPPB). Since the reported sample result for lead was already "not detected," no action was necessary based on the laboratory duplicate comparison.

VII. Matrix Spike Analysis

Matrix spike analysis was performed on sample GW08PB with acceptable recoveries (75-125%) for all target elements.

VIII. ICP Serial Dilution

Serial dilution analysis was performed on sample GW08PB. Results for elements with initial (undiluted) results greater than 50xIDL were acceptable (less than 10 percent difference) except for sodium (14.9%). Results for sodium in all samples were qualified as estimated (J) based on this serial dilution result.

The "E" flags appropriately applied by the laboratory to all of the positive site sample results for sodium were removed by the validator.

IX. Field Duplicates

Sample GW08DPPB was identified as a field duplicate of GW08PB. RPDs between positive paired results were acceptable (QAPP QC ≤25 RPD) for barium (2.1 RPD), calcium (1.7 RPD), iron (0.7 RPD), magnesium (1.8 RPD), manganese (0.6 RPD), nickel (6.4 RPD), potassium (2.2 RPD), and sodium (4.0 RPD), but exceeded the QAPP-specified acceptance limit for cobalt (30 RPD). Results for cobalt in GW08PB and GW08DPPB were qualified as estimated (J) due to poor reproducibility in the field duplicate analyses.

Laboratory-reported results for arsenic in GW08PB (9.0 µg/L) and GW08DPPB (8.2 µg/L) showed good reproducibility (9.3 RPD). Arsenic was also detected in the laboratory duplicate analysis of GW08PB (6.7 µg/L). The three detections of arsenic in samples from this location and the fact that arsenic has been detected at this location in previous sampling events support the conclusion that arsenic is a true sample component. However, the result for arsenic in GW08DPPB warranted qualification based on associated blank contamination (see Section III) and the results for arsenic in GW08PB and its laboratory duplicate did not. Based on all the available quality control data and professional judgment, the result for arsenic in GW08DPPB was qualified as estimated (J) rather than as less than the reported value.

X. Sample Results Verification

Positive sample results were accurately reported from the raw data and IDLs established within three months prior to these sample analyses (on 7/15/02 for all ICP elements on P4 and for mercury on V3) were appropriately reported for those elements that were not detected.

Elevated %RSDs (>20%) among the triplicate measurements taken for each element in each run were found for numerous elements reported at concentrations just slightly above the applicable IDLs. Many of these results were subsequently qualified as less than the reported values due to associated blank contamination or as less than the CRDL due to lack of laboratory or field duplicate confirmation; no additional action was necessary in these cases. Those sample results that were not

so qualified were qualified by the validator as estimated (J) due to the high %RSDs; these values must be considered estimates based on the inconsistent responses obtained at the measured concentrations. The following results were qualified on this basis:

- Arsenic in GW02PB (28.6%).
- Cobalt in GW07PB (26.5%), GW03PB (23.2%), GW04PB (33.6%).
- Antimony (103%) and copper (42.5%) in GW09FBPB.

Positive sample results greater than the applicable IDLs but below the CRDLs were correctly reported by the laboratory with "B" qualifiers. As concentrations approach the IDL the accuracy of the measurement decreases; values closer to the CRDL, however, are probably quite accurate. Therefore, a guideline of 2xIDL was used to determine whether the reported results warranted qualification; specifically, sample results below the respective CRDL, less than 2xIDL and not otherwise qualified warrant qualification as estimated (J). No sample results warranted qualification on this basis.

All "B" qualifiers applied by the laboratory were removed by the validator.

XI. Other QC

Total metals analyses were not performed on these samples.

XII. Documentation

The two applicable chain of custody (COC) records were present in the data package and included all samples reported in this SDG. The following issues were noted:

- Despite a specific request on the COCs, sample pHs on laboratory receipt were not recorded on the COCs.
- A second, facsimile copy of COC #061476 was also included in this data package. The facsimile was signed by the same person and showed the same date/time of laboratory receipt as the "original." However, the two signatures are not identical and the facsimile does not contain two laboratory notations regarding sample condition on laboratory receipt that are on the "original." No explanation for this additional copy of one of the COC records was provided by the laboratory.

- Copies of the courier airbills were not included in the data package to document the shipment portion of the sample transfers. An airbill number, however, was documented on each COC record.

- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should not be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are laboratory-initiated quality control; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

No data package narrative was present in the data package received for review. At the validator's request, the laboratory provided the missing pages via facsimile on 11/1/02. The pages were added to the data package as pages 3A and 3B by the validator.

A QA notice indicating that GW09FBPB was at pH 7 on laboratory receipt and that it was both filtered and chemically preserved to pH 2 by the laboratory was provided by the laboratory via facsimile on 10/31/02, at the validator's request. This document was inserted into the data package as page 220A by the validator.

The laboratory receiving log in the data package received for review did not include any sample pH values measured on receipt at the laboratory. At the validator's request, a corrected receiving log was provided by the laboratory via facsimile on 10/31/02. This corrected record showed acceptable pH values for the dissolved metals samples (pH<2 in all cases), but was incorrect for the ammonia samples (see the wet chemistry validation report for further information). The laboratory was contacted a second time by the validator and a second corrected receiving log was provided via UPS on 11/11/02. The final corrected document was inserted into the data package for SDG #RW1067 as page 220 by the validator, replacing the originally-provided page.

These COC documentation issues do not directly affect the technical validity of the data generated for these samples, however some of them could be problematic if the data were to be used in litigation.

XIII. Overall Assessment

Based on the validation effort, dissolved metals results for samples in SDG No. RW1067 and were qualified as follows:

- Results for selenium in all samples were qualified as estimated (UJ) based on an unacceptably low recovery in an associated CRDL standard. Results for selenium in GW09FBPB, GW05PB, GW06PB, GW07PB, and GW08DPPB were similarly qualified based on negative responses in the associated calibration blanks.

- Results for lead in all samples except GW06PB were qualified as estimated (UJ) based on an unacceptably low recovery in an associated CRDL standard.

- Results for aluminum in GW08PB, GW01PB, GW02PB, GW03PB, GW04PB, GW05PB, GW07PB, GW08DPPB, and GW09FBPB were qualified as less than the reported values (U) due to contamination in the associated preparation and/or calibration blanks.

- Results for barium and magnesium in GW09FBPB were qualified as less than the reported values (U) due to contamination in the associated calibration and preparation blanks.

- The result for beryllium in GW06PB was qualified as less than the reported value (U) due to contamination in the associated calibration blank.

- Results for manganese in GW01PB and GW09FBPB were qualified as less than the reported values (U) due to contamination in the associated calibration blanks.

- Results for chromium in GW01PB, GW08PB, GW02PB, GW03PB, GW04PB GW08DPPB, GW07PB, GW05PB, and GW09FBPB were qualified as estimated (UJ) based on negative responses in the associated calibration and/or preparation blanks.

- Results for copper in GW01PB, GW08PB, GW02PB, GW03PB, and GW04PB were qualified as estimated (UJ) based on negative responses in the associated calibration blanks.

- The result for iron in GW01PB was qualified as estimated (UJ) based on a negative response in the associated calibration blank.

- The result for potassium in GW09FBPB was qualified as estimated (UJ) based on a negative response in the associated calibration blank.

- Results for zinc in GW08PB, GW08DPPB, GW07PB, GW03PB, GW04PB, GW05PB, GW02PB, and GW01PB were qualified as less than the reported values (U) based on associated preparation and/or field blank contamination.

- Results for vanadium in GW08PB, GW08DPPB, GW07PB, GW03PB, GW04PB, GW05PB, GW02PB, GW01PB, and GW09FBPB were qualified as estimated (J, UJ) due to negative responses in the preparation blank.

- Results for cobalt in GW05PB, GW02PB, GW01PB, and GW09FBPB were qualified as estimated (J, UJ) due to negative responses in the preparation blank.

- Results for nickel in all samples were qualified as estimated (J, UJ) due to negative responses in the associated preparation blank.

- Results for silver in all samples were qualified as estimated (UJ) due to negative responses in the associated preparation blank. Results for silver in GW01PB, GW08PB, GW02PB, GW03PB, and GW04PB were similarly qualified based on negative responses in the associated calibration blanks.

- Results for antimony in GW08PB, GW07PB, GW03PB, GW04PB, and GW01PB were qualified as less than the reported values (U) based on associated field blank contamination.

- Results for sodium in all samples were qualified as estimated (J) based on an unacceptable serial dilution result for this analyte.

- Results for cobalt in GW08PB and GW08DPPB were qualified as estimated (J) due to poor reproducibility in the field duplicate analyses.

- The result for arsenic in GW08DPPB was qualified as estimated (J) based on all available quality control data and professional judgment.

- The result for arsenic in GW02PB was qualified as estimated (J) based on an elevated %RSD value among the triplicate ICP measurements.

- Results for cobalt in GW07PB, GW03PB, and GW04PB were qualified as estimated (J) based on elevated %RSD values among the triplicate ICP measurements.

- Results for antimony and copper in GW09FBPB were qualified as estimated (J) based on elevated %RSD values among the triplicate ICP measurements.

All "B" and "E" flags applied by the laboratory were removed by the validator.

Documentation issues observed in the data package are discussed in Section XII.

This validation report should be considered part of the data package for all future distributions of the inorganics data.

TRILLIUM INC.

ATTACHMENT A

DATA TABLES
SDG No. RW1067
Dissolved Metals in Water

Marion Bragg Landfill - September 2001 - Dissolved Metals in Ground Water and Surface Water Samples

All Results are in ug/L

Collection Point ===>		MB-1	MB-1D	MB-2	MB-5	MB-6	MB-7	MB-8	MB-9
Sample ID ========>		GW08PB	GW08DPPB	GW07PB	GW03PB	GW04PB	GW05PB	GW06PB	GW02PB
Lab Sample No. ===>		RW1067-8	RW1067-9	RW1067-7	RW1067-3	RW1067-4	RW1067-5	RW1067-6	RW1067-2
Collection Date. ===>		9/18/02	9/18/02	9/18/02	9/18/02	9/18/02	9/18/02	9/18/02	9/18/02
	CRDL								
Aluminum	200	23.4 U	36.7 U	49.7 U	24.8 U	23.0 U	16.5 U	2410	36.7 U
Antimony	60	2.2 U	1.7 U	2.3 U	1.8 U	2.9 U	1.7 U	1.7 U	1.7 U
Arsenic	10	9.0	8.2 J	87.6	23.7	124	74.8	135	10.4 J
Barium	200	193	189	514	389	371	590	311	66.9
Beryllium	5	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.28 U	0.20 U
Cadmium	5	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
Calcium	5000	118000	116000	129000	94400	117000	98100	137000	57700
Chromium	10	0.40 UJ	0.40 UJ	0.40 UJ	0.40 UJ	0.40 UJ	0.40 UJ	8.0	0.40 UJ
Cobalt	50	1.9 J	1.4 J	1.5 J	1.6 J	1.5 J	0.40 UJ	3.1	0.40 UJ
Copper	25	0.80 UJ	0.80 U	0.80 U	0.80 UJ	0.80 UJ	0.80 U	18.9	0.80 UJ
Iron	100	1520	1510	19600	7900	16100	11000	18200	2080
Lead	3	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ	1.3 UJ	30.3	1.3 UJ
Magnesium	5000	32800	32200	29100	28800	28600	32500	87200	20700
Manganese	15	901	896	133	191	82.3	68.2	278	505
Mercury	0.2	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Nickel	40	1.6 J	1.5 J	1.6 J	2.2 J	10.8 J	0.72 J	11.5 J	0.60 UJ
Potassium	5000	3160	3090	10800	6570	10300	15400	27400	1620
Selenium	5	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ
Silver	10	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Sodium	5000	12600 J	12100 J	17000 J	15600 J	13100 J	31900 J	112000 J	8600 J
Thallium	10	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U
Vanadium	50	0.30 UJ	0.30 UJ	0.30 UJ	0.30 UJ	0.30 UJ	0.30 UJ	5.6	0.30 UJ
Zinc	20	3.1 U	11.6 U	5.1 U	7.0 U	6.1 U	8.1 U	80.8	3.1 U

Marion Bragg Landfill - September 2001 - Dissolved Metals in Ground Water and Surface Water Samples

All Results are in ug/L

Collection Point ==>		MB-10		Field Blank	
Sample ID ==========>		GW01PB		GW09FBPB	
Lab Sample No. ==>		RW1067-1		RW1067-10	
Collection Date. ==>		9/18/02		9/18/02	
	CRDL				
Aluminum	200	21.5	U	141	U
Antimony	60	1.9	U	2.5	J
Arsenic	10	2.5	U	2.5	U
Barium	200	94.7		1.4	U
Beryllium	5	0.20	U	0.20	U
Cadmium	5	0.40	U	0.40	U
Calcium	5000	111000		609	
Chromium	10	0.40	UJ	0.40	UJ
Cobalt	50	0.40	UJ	0.40	UJ
Copper	25	0.80	UJ	1.1	J
Iron	100	8.6	UJ	8.6	U
Lead	3	1.3	UJ	1.3	UJ
Magnesium	5000	34300		88.7	U
Manganese	15	1.5	U	0.59	U
Mercury	0.2	0.10	U	0.10	U
Nickel	40	0.60	UJ	0.60	UJ
Potassium	5000	2740		67.1	UJ
Selenium	5	1.7	UJ	1.7	UJ
Silver	10	0.50	UJ	0.50	UJ
Sodium	5000	11800	J	124	J
Thallium	10	4.2	U	4.2	U
Vanadium	50	0.30	UJ	0.30	UJ
Zinc	20	6.4	U	10.2	

TRILLIUM INC.

ATTACHMENT B

INORGANIC ANALYSIS DATA SHEETS (Form Is)
SDG No. RW1067
Dissolved Metals in Water

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

GW08PB MB-1

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067 CAE 11/7/02

Matrix (soil/water): WATER Lab Sample ID: RW1067-8

Level (low/med): LOW Date Received: 9/19/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	23.4	B	U	P
7440-36-0	Antimony	2.2	B	U	P
7440-38-2	Arsenic	9.0	B		P
7440-39-3	Barium	193	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.40	U		P
7440-70-2	Calcium	118000			P
7440-47-3	Chromium	0.40	U	UJ	P
7440-48-4	Cobalt	1.9	B	J	P
7440-50-8	Copper	0.80	U	UJ	P
7439-89-6	Iron	1520			P
7439-92-1	Lead	1.3	U	UJ	P
7439-95-4	Magnesium	32800			P
7439-96-5	Manganese	901			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	1.6	B	J	P
7440-09-7	Potassium	3160	B		P
7782-49-2	Selenium	1.7	U	UJ	P
7440-22-4	Silver	0.50	U	UJ	P
7440-23-5	Sodium	12600		B J	P
7440-28-0	Thallium	4.2	U		P
7440-62-2	Vanadium	0.30	U	UJ	P
7440-66-6	Zinc	3.1	B	U	P

CAE 11/7/02 CAE ERIKSON

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

GW08DPPB
MB-1D

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067 CAE 11/7/02

Matrix (soil/water): WATER Lab Sample ID: RW1067-9

Level (low/med): LOW Date Received: 9/19/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	36.7	B	U	P
7440-36-0	Antimony	1.7	U		P
7440-38-2	Arsenic	8.2	B	J	P
7440-39-3	Barium	189	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.40	U		P
7440-70-2	Calcium	116000			P
7440-47-3	Chromium	0.40	B	UJ	P
7440-48-4	Cobalt	1.4	B	J	P
7440-50-8	Copper	0.80	U		P
7439-89-6	Iron	1510			P
7439-92-1	Lead	1.3	B	UJ	P
7439-95-4	Magnesium	32200			P
7439-96-5	Manganese	896			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	1.5	B	J	P
7440-09-7	Potassium	3090	B		P
7782-49-2	Selenium	1.7	B	UJ	P
7440-22-4	Silver	0.50	B	UJ	P
7440-23-5	Sodium	12100		B J	P
7440-28-0	Thallium	4.2	U		P
7440-62-2	Vanadium	0.30	B	UJ	P
7440-66-6	Zinc	11.6	B	U	P

CAE 11/7/02 CAE/KSON

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U. S. EPA-CLP

-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

GW07PB MB-2

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix (soil/water): WATER Lab Sample ID: RW1067-7

Level (low/med): LOW Date Received: 9/19/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	49.7	B	U	P
7440-36-0	Antimony	2.3	B	U	P
7440-38-2	Arsenic	87.6			P
7440-39-3	Barium	514			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.40	U		P
7440-70-2	Calcium	129000			P
7440-47-3	Chromium	0.40	U	UJ	P
7440-48-4	Cobalt	1.5	B	J	P
7440-50-8	Copper	0.80	U		P
7439-89-6	Iron	19600			P
7439-92-1	Lead	1.3	U	UJ	P
7439-95-4	Magnesium	29100			P
7439-96-5	Manganese	133			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	1.6	B	J	P
7440-09-7	Potassium	10800			P
7782-49-2	Selenium	1.7	U	UJ	P
7440-22-4	Silver	0.50	U	UJ	P
7440-23-5	Sodium	17000		J	P
7440-28-0	Thallium	4.2	U		P
7440-62-2	Vanadium	0.30	U	UJ	P
7440-66-6	Zinc	5.1	B	U	P

CAE 11/7/02

11/7/02

CAE 11/8/02

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

GW03PB
MB-5
CAE 11/7/02

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix (soil/water): WATER Lab Sample ID: RW1067-3

Level (low/med): LOW Date Received: 9/19/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	24.8	B	U	P
7440-36-0	Antimony	1.8	B	U	P
7440-38-2	Arsenic	23.7			P
7440-39-3	Barium	389			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.40	U		P
7440-70-2	Calcium	94400			P
7440-47-3	Chromium	0.40	U	UJ	P
7440-48-4	Cobalt	1.6	B	J	P
7440-50-8	Copper	0.80	U	UJ	P
7439-89-6	Iron	7900			P
7439-92-1	Lead	1.3	U	UJ	P
7439-95-4	Magnesium	28800			P
7439-96-5	Manganese	191			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	2.2	B	J	P
7440-09-7	Potassium	6570			P
7782-49-2	Selenium	1.7	U	UJ	P
7440-22-4	Silver	0.50	U	UJ	P
7440-23-5	Sodium	15600		E J	P
7440-28-0	Thallium	4.2	U		P
7440-62-2	Vanadium	0.30	U	UJ	P
7440-66-6	Zinc	7.0	B	U	P

CAE 11/7/02 CA Erikson

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

GW04PB
MB-6
CAE 11/7/02

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix (soil/water): WATER Lab Sample ID: RW1067-4

Level (low/med): LOW Date Received: 9/19/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	23.0	B	U	P
7440-36-0	Antimony	2.9	B	U	P
7440-38-2	Arsenic	124			P
7440-39-3	Barium	371			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.40	U		P
7440-70-2	Calcium	117000			P
7440-47-3	Chromium	0.40	U	UJ	P
7440-48-4	Cobalt	1.5	B	J	P
7440-50-8	Copper	0.80	U	UJ	P
7439-89-6	Iron	16100			P
7439-92-1	Lead	1.3	U	UJ	P
7439-95-4	Magnesium	28600			P
7439-96-5	Manganese	82.3			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	10.8	B	J	P
7440-09-7	Potassium	10300			P
7782-49-2	Selenium	1.7	U	UJ	P
7440-22-4	Silver	0.50	U	UJ	P
7440-23-5	Sodium	13100		E J	P
7440-28-0	Thallium	4.2	U		P
7440-62-2	Vanadium	0.30	U	UJ	P
7440-66-6	Zinc	6.1	B	U	P

CAE 11/7/02 CAE ERIKSON

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

GW05PB

MB-7 CAE 11/7/02

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix (soil/water): WATER Lab Sample ID: RW1067-5

Level (low/med): LOW Date Received: 9/19/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	16.5	B	U	P
7440-36-0	Antimony	1.7	U		P
7440-38-2	Arsenic	74.8			P
7440-39-3	Barium	590			P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.40	U		P
7440-70-2	Calcium	98100			P
7440-47-3	Chromium	0.40	V	UJ	P
7440-48-4	Cobalt	0.40	V	UJ	P
7440-50-8	Copper	0.80	U		P
7439-89-6	Iron	11000			P
7439-92-1	Lead	1.3	V	UJ	P
7439-95-4	Magnesium	32500			P
7439-96-5	Manganese	68.2			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	0.72	B	J	P
7440-09-7	Potassium	15400			P
7782-49-2	Selenium	1.7	V	UJ	P
7440-22-4	Silver	0.50	V	UJ	P
7440-23-5	Sodium	31900		E J	P
7440-28-0	Thallium	4.2	U		P
7440-62-2	Vanadium	0.30	V	UJ	P
7440-66-6	Zinc	8.1	B	U	P

CAE 11/7/02 CAE Erikson

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MB-8 GW06PB

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

CAE 11/7/02

Matrix (soil/water): WATER Lab Sample ID: RW1067-6

Level (low/med): LOW Date Received: 9/19/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	2410			P
7440-36-0	Antimony	1.7	U		P
7440-38-2	Arsenic	135			P
7440-39-3	Barium	311			P
7440-41-7	Beryllium	0.28	B	U	P
7440-43-9	Cadmium	0.40	U		P
7440-70-2	Calcium	137000			P
7440-47-3	Chromium	8.0	B		P
7440-48-4	Cobalt	3.1	B		P
7440-50-8	Copper	18.9	B		P
7439-89-6	Iron	18200			P
7439-92-1	Lead	30.3			P
7439-95-4	Magnesium	87200			P
7439-96-5	Manganese	278			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	11.5	B	J	P
7440-09-7	Potassium	27400			P
7782-49-2	Selenium	1.7	U	UJ	P
7440-22-4	Silver	0.50	U	UJ	P
7440-23-5	Sodium	112000		B J	P
7440-28-0	Thallium	4.2	U		P
7440-62-2	Vanadium	5.6	B		P
7440-66-6	Zinc	80.8			P

CAE 11/7/02 CASERSON

Color Before: COLORLESS Clarity Before: CLOUDY Texture:

Color After: COLORLESS Clarity After: CLOUDY Artifacts:

Comments:

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

GW02PB

MB-9

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067 Case 11/7/02

Matrix (soil/water): WATER Lab Sample ID: RW1067-2

Level (low/med): LOW Date Received: 9/19/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	36.7	B	U	P
7440-36-0	Antimony	1.7	U		P
7440-38-2	Arsenic	10.4		J	P
7440-39-3	Barium	66.9	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.40	U		P
7440-70-2	Calcium	57700			P
7440-47-3	Chromium	0.40	U	UJ	P
7440-48-4	Cobalt	0.40	U	UJ	P
7440-50-8	Copper	0.80	U	UJ	P
7439-89-6	Iron	2080			P
7439-92-1	Lead	1.3	U	UJ	P
7439-95-4	Magnesium	20700			P
7439-96-5	Manganese	505			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	0.60	U	UJ	P
7440-09-7	Potassium	1620	B		P
7782-49-2	Selenium	1.7	U	UJ	P
7440-22-4	Silver	0.50	U	UJ	P
7440-23-5	Sodium	8600		J	P
7440-28-0	Thallium	4.2	U		P
7440-62-2	Vanadium	0.30	U	UJ	P
7440-66-6	Zinc	3.1	B	U	P

11/7/02

CA Erickson

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

GW01PB

MB-10

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

CAE 11/7/02

Matrix (soil/water): WATER Lab Sample ID: RW1067-1

Level (low/med): LOW Date Received: 9/19/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	21.5	B	U	P
7440-36-0	Antimony	1.9	B	U	P
7440-38-2	Arsenic	2.5	U		P
7440-39-3	Barium	94.7	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.40	U		P
7440-70-2	Calcium	111000			P
7440-47-3	Chromium	0.40	U	UJ	P
7440-48-4	Cobalt	0.40	U	UJ	P
7440-50-8	Copper	0.80	U	UJ	P
7439-89-6	Iron	8.6	U	UJ	P
7439-92-1	Lead	1.3	U	UJ	P
7439-95-4	Magnesium	34300			P
7439-96-5	Manganese	1.5	B	U	P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	0.60	U	UJ	P
7440-09-7	Potassium	2740	B		P
7782-49-2	Selenium	1.7	U	UJ	P
7440-22-4	Silver	0.50	U	UJ	P
7440-23-5	Sodium	11800		B J	P
7440-28-0	Thallium	4.2	U		P
7440-62-2	Vanadium	0.30	U	UJ	P
7440-66-6	Zinc	6.4	B	U	P

CAE 11/7/02

CAE 11/7/02

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U. S. EPA-CLP
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

GW09FBPB

Field Blank
CAE 11/7/02

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RW1067

Matrix (soil/water): WATER Lab Sample ID: RW1067-10

Level (low/med): LOW Date Received: 9/19/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	141	B	U	P
7440-36-0	Antimony	2.5	B	J	P
7440-38-2	Arsenic	2.5	U		P
7440-39-3	Barium	1.4	B	U	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.40	U		P
7440-70-2	Calcium	609	B		P
7440-47-3	Chromium	0.40	U	UJ	P
7440-48-4	Cobalt	0.40	U	UJ	P
7440-50-8	Copper	1.1	B	J	P
7439-89-6	Iron	8.6	U		P
7439-92-1	Lead	1.3	U	UJ	P
7439-95-4	Magnesium	88.7	B	U	P
7439-96-5	Manganese	0.59	B	U	P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	0.60	U	UJ	P
7440-09-7	Potassium	67.1	U	UJ	P
7782-49-2	Selenium	1.7	U	UJ	P
7440-22-4	Silver	0.50	U	UJ	P
7440-23-5	Sodium	124	B	J	P
7440-28-0	Thallium	4.2	U		P
7440-62-2	Vanadium	0.30	U	UJ	P
7440-66-6	Zinc	10.2	B		P

CAE 11/7/02 Validation

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

TRILLIUM INC.

DATA VALIDATION

FOR

MARION BRAGG LANDFILL
MARION, INDIANA

INORGANIC ANALYSIS DATA
Dissolved Metals in Water

SDG No. RU1067
Samples Collected September 2002

Chemical Analyses Performed by:

CompuChem Environmental
Cary, North Carolina

FOR

O & M, Inc.
Danville, Indiana

BY

Trillium, Inc.
356 Farragut Crossing Drive
Knoxville, Tennessee 37922
(865) 966-8880

November 12, 2002

EXECUTIVE SUMMARY

Validation of the inorganics analysis data (dissolved metals) prepared by CompuChem Environmental for five surface water samples from the Marion Bragg Landfill Site in Marion, Indiana, has been completed by Trillium, Inc. The data were reported by the laboratory in a single separate data package under Sample Delivery Group (SDG) No. RU1067, which was received for review on April 2, 2002, with additional documentation provided on October 28, 2002, and November 11, 2002. The following samples were reported:

PW01PB (PW-1)	SW01PB (SW-1)	SW01DPPB (SW-1D)
SW02PB (SW-5)	SW03PB (SW-6)	

Findings of the validation effort resulted in the following qualifications of sample results:

- Results for nickel in PW01PB and SW03PB were qualified as less than the reported values (U).
- Results for zinc in PW01PB, SW01PB, SW02PB, and SW03PB were qualified as estimated (J, UJ).
- The result for selenium in SW01PB was qualified as less than the reported value (U).
- Results for vanadium in PW01PB, SW01DPPB, SW02PB, and SW03PB were qualified as estimated (J, UJ).
- Results for antimony, chromium, and cobalt in SW01PB were qualified as less than the contract required detection limits (60.0 U, 10.0 U, and 50.0 U, respectively).
- Results for barium and potassium in all samples were qualified as estimated (J).
- Results for arsenic, copper, nickel, and vanadium in SW01PB and SW01DPPB were qualified as estimated (J).
- The result for zinc in SW01DPPB was qualified as less than the contract required detection limit (20.0 U).
- Results for arsenic in PW01PB and SW02PB were qualified as estimated (J).
- Results for chromium, copper, and nickel in SW02PB were qualified as estimated (J).
- The result for copper in SW03PB was qualified as estimated (J).

All "B" and "E" flags applied by the laboratory were removed by the validator.

Brief explanations of the reasons for the actions taken above may be found in the Overall Assessment (Section XIII). Details of the validation findings and conclusions based on review of the results for each quality control requirement are provided in the remaining sections of this report.

Documentation issues are discussed in Section XII of this report.

This validation report should be considered part of the data package for all future distributions of the inorganics data.

INTRODUCTION

Analyses were performed according to the USEPA Contract Laboratory Program (CLP) Statement of Work ILM04.0. All target analytes (dissolved metals) were analyzed using trace ICP (inductively coupled plasma) and cold vapor atomic absorption (CVAA) instrumentation. Results of analyses are reported by the laboratory as either qualified or unqualified; various qualifier codes denote specific information regarding the analytical results.

Trillium's validation was performed in accordance with the EPA "National Functional Guidelines for Inorganic Data Review" (EPA 540/R-94/013, 2/94). The EPA Region II Standard Operating Procedure (SOP) No. HW-2, (Revision XI), January 1992, "Evaluation of Metals Data for the Contract Laboratory Program (CLP)" was also used as guidance for the validation effort, and professional judgment was applied as necessary and appropriate.

The data validation process is intended to evaluate data on a technical basis rather than a contract compliance basis for chemical analyses conducted under the CLP. An initial assumption is that each data package is presented in accordance with the CLP requirements. It is also assumed that each data package represents the best efforts of the laboratory and has already been subjected to adequate and sufficient quality review prior to submission for validation.

During the validation process, laboratory data are verified against all available supporting documentation. Based on the review, qualifier codes may be added, deleted, or modified by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes as defined by the National Functional Guidelines:

U - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

R - The data are unusable. (Note: The analyte may or may not be present.)

J - The associated value is an estimated quantity.

UJ - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

These codes are recorded on the customized data tables contained in Attachment A as well as on the Inorganic Analysis Data Sheets (Form Is) in Attachment B of this validation report to qualify the results as appropriate according to the review of the data packages.

Two facts should be noted by all data users. First, **the "R" qualifier means that the laboratory-reported value is unusable.** In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, **no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable.** Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.

I. Holding Times, Preservation and Sample Integrity

The surface water samples were collected on 9/17/02. All metals analyses were conducted on 10/1/02, which is well within acceptable holding times (28 days for mercury and six months for all other analytes).

Field filtration of the surface water samples for dissolved metals analysis was not clearly documented by the sampling team on the applicable chain of custody (COC) record. A "B" (for "both") was recorded in the COC field used to designate filtered or unfiltered; no clarification of what was filtered and unfiltered was documented. For the purposes of this validation effort, it was assumed that the appropriate sample containers for dissolved metals analysis were field-filtered prior to chemical preservation.

Chemical preservation of the samples for dissolved metals analysis with nitric acid and ice was clearly documented on the COC. Acceptable cooler temperatures (4-6 °C) on laboratory receipt were recorded on the COC and on the laboratory's receiving log. Acceptable sample pHs (<2) were not documented on the COC but were recorded on the applicable receiving and preparation logs. Therefore, successful sample preservation in the field was confirmed.

According to the narrative in the data package, all samples were received intact and in good condition.

II. Calibrations

Sample analyses for all Trace ICP target elements were performed in a single analysis series on 10/1/02 on an instrument identified as "P3." Mercury analyses were performed in a single CVAA series run on 10/1/02 on an instrument identified as "V3." A linearity check at the start of the CVAA series gave an acceptable correlation coefficient (>0.995). Initial and continuing calibration verification (ICV/CCV) standards were satisfactory for all metals reported from both applicable analysis series (90-110% for all ICP target analytes and 80-120% for mercury).

Contract required detection limit (CRDL) standards were run at regular intervals throughout the ICP analysis series; all applicable analytes were at the required concentrations (2xCRDL). Recoveries were acceptable (80-120%) for all analytes in all CRDL standards.

A CRDL standard was also run at the start of the analysis series for mercury. The recovery for mercury in this standard (95.0%) was acceptable.

III. Blanks

No metals calibration blanks had values above the CRDLs or less than the negative CRDLs for any target element. However, responses above the applicable instrument detection limits (IDLs) were found for various combinations of 14 different elements (barium, beryllium, cadmium, calcium, chromium, cobalt, iron, lead, magnesium, nickel, potassium, sodium, thallium, and vanadium) in each of the initial and continuing calibration blanks (ICB/CCBs); in addition, results for one or more of four elements (calcium, copper, sodium, and zinc) that were below the negative IDLs were also reported in each of the ICB/CCBs. Results for samples analyzed within five runs of an affected ICB/CCB warrant qualification if the sample result is less than five times the positive blank value or less than two times the absolute value of the negative blank response. Results for nickel in PW01PB and SW03PB were qualified as less than the reported values (U) due to contamination in the associated calibration blanks.

Results for zinc in PW01PB, SW01PB, SW02PB, and SW03PB were qualified as estimated (J, UJ) based on negative responses in the associated calibration blanks.

Sample results for all remaining elements for which positive or negative responses were found in the ICB/CCBs were not affected by the associated calibration blank values.

One preparation blank (PBW) was prepared and analyzed with the samples in this SDG. Responses for calcium (-52.37 µg/L), selenium (3.01 µg/L), vanadium (-0.42 µg/L), and zinc (-2.74 µg/L) were reported in the preparation blank. All sample results for calcium were greater than the action limit for qualification based on this blank response, therefore no sample results for calcium were qualified on this basis. The result for selenium in SW01PB was qualified as less than the reported value (U) due to the associated PBW contamination. Results for vanadium in PW01PB, SW01DPPB, SW02PB, and SW03PB and for zinc in PW01PB, SW01PB, SW02PB, and SW03PB were qualified as estimated (J, UJ) based on negative responses in the associated PBW.

Some of the actions warranted based on PBW responses are redundant with actions taken based on CCB results; no additional action was taken in these cases.

No field-submitted blanks were associated with these samples.

IV. ICP Interference Check Sample

All interference check sample results were satisfactory (80-120 percent recovery).

V. Laboratory Control Sample

One laboratory control sample (LCS) was run for all ICP target analytes in association with this SDG. All laboratory control sample results for the ICP target analytes were satisfactory (80-120 percent recovery).

Based on the available documentation, no LCS samples were prepared or analyzed for mercury.

VI. Laboratory Duplicate Analysis

Duplicate analysis was performed on sample SW01PB for all target analytes. Relative percent differences (RPDs) between positive paired analytes in SW01PB and its duplicate were below the maximum acceptance limit of 20% for all elements detected at concentrations greater than five times the CRDL. For elements detected at concentrations less than five times the CRDL in the paired analyses, the difference between the paired results must be less than ±CRDL. This criterion was met for all applicable target analytes.

Positive results below the CRDL for antimony (2.2 µg/L), chromium (0.86 µg/L), and cobalt (1.9 µg/L) were reported in the original analysis of SW01PB but were not confirmed in the duplicate analysis (1.6 U, 0.60 U, and 0.40 U), respectively). Antimony, chromium, and cobalt were also not detected in the field duplicate of SW01PB (SW01DPPB; see Section IX). Based on professional judgment, results for antimony, chromium, and cobalt in SW01PB were qualified as less than the CRDLs (60.0 U, 10.0 U, and 50.0 U, respectively) due to lack of confirmation in the laboratory duplicate analyses.

VII. Matrix Spike Analysis

Matrix spike analysis was performed on sample SW01PB with acceptable recoveries (75-125%) for all target elements.

VIII. ICP Serial Dilution

Serial dilution analysis was performed on samples SW01PB. Results for elements with initial (undiluted) results greater than 50xIDL were acceptable (less than 10 percent difference) except for barium (10.4%) and potassium (28.0%). Results for barium and potassium in all samples were qualified as estimated (J) based on these serial dilution results.

The "E" flags appropriately applied by the laboratory to all of the positive site sample results for potassium were removed by the validator.

IX. Field Duplicates

Sample SW01DPPB was identified as a field duplicate of SW01PB. RPDs between positive paired results were acceptable (QAPP QC ≤25 RPD) for barium (8.3 RPD), calcium (0.2 RPD), magnesium (0.8 RPD), manganese (5.0 RPD), potassium (0.9 RPD), and sodium (0.4 RPD), but exceeded the QAPP-specified acceptance limit for arsenic (32 RPD), copper (64 RPD), nickel (32 RPD) and vanadium (114 RPD). Results for arsenic, copper, nickel, and vanadium in SW01PB and SW01DPPB were qualified as estimated (J) due to poor reproducibility in the field duplicate analyses.

Positive results below the CRDLs for antimony (2.2 µg/L), chromium (0.86 µg/L), and cobalt (1.9 µg/L) were reported in SW01PB but were not confirmed in SW01DPPB (1.6 U, 0.60 U, and 0.40 U, respectively). Similarly, a result below the CRDL for zinc (15.9 µg/L) was reported in SW01DPPB but was not confirmed in SW01PB (0.70 U). Based on professional judgment, results for antimony, chromium, and cobalt in SW01PB and for zinc in SW01DPPB were qualified as less than the CRDLs (60.0 U, 10.0 U, 50.0 U, and 20.0 U, respectively) due to the lack of field duplicate confirmation.

X. Sample Results Verification

Positive sample results were accurately reported from the raw data and IDLs established within three months prior to these sample analyses (on 7/15/02 for all ICP elements on P3 and for mercury on V3) were appropriately reported for those elements that were not detected.

Elevated %RSDs (>20%) among the triplicate measurements taken for each element in each run were found for numerous elements reported at concentrations below the applicable CRDLs. Many of these results were subsequently qualified as less than the reported values due to associated blank contamination or as less than the CRDL due to lack of laboratory or field duplicate confirmation, or as estimated for reasons previously discussed; no additional action was necessary in these cases. Those sample results that were not so qualified were qualified by the validator as estimated (J) due to the high %RSDs; these values must be considered estimates based on the inconsistent responses obtained at the measured concentrations. The following results were qualified on this basis:

- Arsenic in PW01PB (27.5%) and SW02PB (99.3%).
- Chromium (41.8%), copper (65.5%), and nickel (38.1%) in SW02PB.

Positive sample results greater than the applicable IDLs but below the CRDLs were correctly reported by the laboratory with "B" qualifiers. As concentrations approach the IDL the accuracy of the measurement decreases; values closer to the CRDL, however, are probably quite accurate. Therefore, a guideline of 2xIDL was used to determine whether the reported results warranted qualification; specifically, sample results below the respective CRDL, less than 2xIDL and not otherwise qualified warrant qualification as estimated (J). The result for copper in SW03PB was so qualified on this basis.

All "B" qualifiers applied by the laboratory were removed by the validator.

XI. Other QC

Total metals analyses were not performed on these samples.

XII. Documentation

The applicable chain of custody (COC) record was present in the data package. The following issues were noted:

- Sample PW01PB was not recorded by the sampler on the COC. An appropriate notation to this effect was made by the laboratory on the COC.
- Despite a specific request on the COC, sample pHs on laboratory receipt were not recorded on the COC.
- A copy of the courier airbill was not included in the data package to document the shipment portion of the sample transfers. An airbill number, however, was documented on the COC record.
- Although this approach is specified by the Quality Assurance Project Plan (QAPP), additional sample volumes provided to facilitate the laboratory's analysis of an MS/MSD pair should not be recorded on the COC as separate samples. Instead, a notation should be made indicating the sample for which extra volume has been provided, with the instruction that this sample be used for the MS/MSD analysis. MS/MSD analyses are laboratory-initiated quality control; if not for the logistical need to provide sufficient volume for the multiple analyses involved, MS/MSD pairs would never be mentioned on COC documentation.

Laboratory receiving logs (for SDG No. RU1067 and SDG No. RW1067) in the data package received for review did not include any sample pH values measured on receipt at the laboratory. At

the validator's request, corrected receiving logs were provided by the laboratory via facsimile on 10/31/02. Both corrected records showed acceptable pH values for the dissolved metals samples (pH<2 in all cases). The corrected log for SDG No. RU1067 was also correct for the ammonia samples, but the corrected log for SDG No. RW1067 was incorrect for the ammonia samples (see the wet chemistry validation report for further information). The laboratory was contacted a second time by the validator and a second corrected receiving log for SDG No. RW1067 was provided via UPS on 11/11/02. The two final corrected documents were inserted into the data package for SDG #RU1067 as pages 134-135 by the validator, replacing the originally-provided pages.

These COC documentation issues do not directly affect the technical validity of the data generated for these samples, however some of them could be problematic if the data were to be used in litigation.

XIII. Overall Assessment

Based on the validation effort, dissolved metals results for samples in SDG No. RU1067 and were qualified as follows:

- Results for nickel in PW01PB and SW03PB were qualified as less than the reported values (U) due to contamination in the associated calibration blanks.
- Results for zinc in PW01PB, SW01PB, SW02PB, and SW03PB were qualified as estimated (J, UJ) based on negative responses in the associated calibration and preparation blanks.
- The result for selenium in SW01PB was qualified as less than the reported value (U) due to contamination in the associated preparation blank.
- Results for vanadium in PW01PB, SW01DPPB, SW02PB, and SW03PB were qualified as estimated (J, UJ) based on negative responses in the associated preparation blank.
- Results for antimony, chromium, and cobalt in SW01PB were qualified as less than the CRDLs (60.0 U, 10.0 U, and 50.0 U, respectively) based on lack of confirmation in the laboratory and field duplicate analyses and professional judgment.
- Results for barium and potassium in all samples were qualified as estimated (J) based on unacceptable serial dilution results.
- Results for arsenic, copper, nickel, and vanadium in SW01PB and SW01DPPB were qualified as estimated (J) due to poor reproducibility in the field duplicate analyses.

- The result for zinc in SW01DPPB was qualified as less than the CRDL (20.0 U) based on lack of field duplicate confirmation and professional judgment.

- Results for arsenic in PW01PB and SW02PB were qualified as estimated (J) based on elevated %RSD values among the triplicate ICP measurements.

- Results for chromium, copper, and nickel in SW02PB were qualified as estimated (J) based on elevated %RSD values among the triplicate ICP measurements.

- The result for copper in SW03PB was qualified as estimated (J) because it was less than 2xIDL and was not otherwise qualified.

All "B" and "E" flags applied by the laboratory were removed by the validator.

Documentation issues observed in the data package are discussed in Section XII.

This validation report should be considered part of the data package for all future distributions of the inorganics data.

TRILLIUM INC.

ATTACHMENT A

DATA TABLE
SDG No. RU1067
Dissolved Metals in Water

Marion Bragg Landfill - September 2001 - Dissolved Metals in Surface Water Samples

All Results are in ug/L

Collection Point ===>		PW-1	SW-1	SW-1D	SW-5	SW-6
Sample ID ========>		PW01PB	SW01PB	SW01DPPB	SW02PB	SW03PB
Lab Sample No. ===>		RU1067-5	RU1067-1	RU1067-2	RU1067-3	RU1067-4
Collection Date. ===>		9/17/02	9/17/02	9/17/02	9/17/02	9/17/02
	CRDL					
Aluminum	200	57.7 U	57.7 U	57.7 U	57.7 U	57.7 U
Antimony	60	1.6 U	60.0 U	1.6 U	1.6 U	1.6 U
Arsenic	10	3.3 J	2.9 J	2.1 J	1.5 J	1.3 U
Barium	200	104 J	108 J	99.4 J	97.6 J	69.7 J
Beryllium	5	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Cadmium	5	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Calcium	5000	35700	85400	85200	84000	98900
Chromium	10	0.60 U	10.0 U	0.60 U	0.78 J	0.60 U
Cobalt	50	0.40 U	50.0 U	0.40 U	0.40 U	0.40 U
Copper	25	0.60 U	2.9 J	1.5 J	1.3 J	1.1 J
Iron	100	8.7 U	8.7 U	8.7 U	8.7 U	8.7 U
Lead	3	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U
Magnesium	5000	30100	36600	36300	35300	42900
Manganese	15	0.50 U	12.2	11.6	8.8	46.9
Mercury	0.2	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Nickel	40	1.9 U	2.9 J	2.1 J	1.1 J	0.80 U
Potassium	5000	4410 J	3400 J	3370 J	3230 J	2450 J
Selenium	5	2.9 U	3.6 U	2.9 U	2.9 U	2.9 U
Silver	10	0.70 U	0.70 U	0.70 U	0.70 U	0.70 U
Sodium	5000	18100	44100	43900	42900	24700
Thallium	10	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
Vanadium	50	0.40 UJ	2.9 J	0.79 J	0.40 UJ	0.40 UJ
Zinc	20	0.70 UJ	0.70 UJ	20.0 U	2.5 J	0.70 UJ

TRILLIUM INC.

ATTACHMENT B

INORGANIC ANALYSIS DATA SHEETS (Form Is)
SDG No. RU1067
Dissolved Metals in Water

U. S. EPA-CLP
-I-
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

PW01PB

PW-1

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Case 11/7/02

Matrix (soil/water): WATER Lab Sample ID: RU1067-5

Level (low/med): LOW Date Received: 9/19/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	57.7	U		P
7440-36-0	Antimony	1.6	U		P
7440-38-2	Arsenic	3.3	B	J	P
7440-39-3	Barium	104	B	J	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	35700			P
7440-47-3	Chromium	0.60	U		P
7440-48-4	Cobalt	0.40	U		P
7440-50-8	Copper	0.60	U		P
7439-89-6	Iron	8.7	U		P
7439-92-1	Lead	0.70	U		P
7439-95-4	Magnesium	30100			P
7439-96-5	Manganese	0.50	U		P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	1.9	B	U	P
7440-09-7	Potassium	4410	B	J	P
7782-49-2	Selenium	2.9	U		P
7440-22-4	Silver	0.70	U		P
7440-23-5	Sodium	18100			P
7440-28-0	Thallium	2.6	U		P
7440-62-2	Vanadium	0.40	B	UJ	P
7440-66-6	Zinc	0.70	B	UJ	P

Case 11/7/02 CA Erickson

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: DISSOLVED

UG 09

U. S. EPA-CLP

-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SW01PB
SW-1

CAE 11/7/02

Lab Name: COMPUCHEM Contract: ______

Lab Code: LIBRTY Case No.: ______ SAS No.: ______ SDG No.: RU1067

Matrix (soil/water): WATER *Lab Sample ID:* RU1067-1

Level (low/med): LOW Date Received: 9/19/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	57.7	U		P
7440-36-0	Antimony	40.0 ~~2.2~~	~~B~~	U	P
7440-38-2	Arsenic	2.9	~~B~~	J	P
7440-39-3	Barium	108	~~B~~	~~E~~ J	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	85400			P
7440-47-3	Chromium	10.0 ~~0.86~~	~~B~~	U	P
7440-48-4	Cobalt	50.0 ~~1.9~~	~~B~~	U	P
7440-50-8	Copper	2.9	~~B~~	J	P
7439-89-6	Iron	8.7	U		P
7439-92-1	Lead	0.70	U		P
7439-95-4	Magnesium	36600			P
7439-96-5	Manganese	12.2	~~B~~		P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	2.9	~~B~~	J	P
7440-09-7	Potassium	3400	~~B~~	~~E~~ J	P
7782-49-2	Selenium	3.6	~~B~~	U	P
7440-22-4	Silver	0.70	U		P
7440-23-5	Sodium	44100			P
7440-28-0	Thallium	2.6	U		P
7440-62-2	Vanadium	2.9	~~B~~	J	P
7440-66-6	Zinc	0.70	~~B~~	UJ	P

CAE 11/7/02 CA Erikson

Color Before: COLORLESS Clarity Before: CLEAR Texture: ______

Color After: COLORLESS Clarity After: CLEAR Artifacts: ______

Comments: DISSOLVED

00011

U. S. EPA-CLP

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SW01DPPB

SW-1D CAE 11/7/02

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067

Matrix (soil/water): WATER Lab Sample ID: RU1067-2

Level (low/med): LOW Date Received: 9/19/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	57.7	U		P
7440-36-0	Antimony	1.6	U		P
7440-38-2	Arsenic	2.1	~~B~~	J	P
7440-39-3	Barium	99.4	~~B~~	~~B~~ J	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	85200			P
7440-47-3	Chromium	0.60	U		P
7440-48-4	Cobalt	0.40	U		P
7440-50-8	Copper	1.5	~~B~~	J	P
7439-89-6	Iron	8.7	U		P
7439-92-1	Lead	0.70	U		P
7439-95-4	Magnesium	36300			P
7439-96-5	Manganese	11.6	~~B~~		P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	2.1	~~B~~	J	P
7440-09-7	Potassium	3370	~~B~~	~~B~~ J	P
7782-49-2	Selenium	2.9	U		P
7440-22-4	Silver	0.70	U		P
7440-23-5	Sodium	43900			P
7440-28-0	Thallium	2.6	U		P
7440-62-2	Vanadium	0.79	~~B~~	J	P
7440-66-6	Zinc	20.0 ~~15.9~~	~~B~~	U	P

CAE 11/7/02 CAE/KSON

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: DISSOLVED

U. S. EPA-CLP

-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SW-5 SW02PB

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: RU1067 Case 11/7/02

Matrix (soil/water): WATER Lab Sample ID: RU1067-3

Level (low/med): LOW Date Received: 9/19/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	57.7	U		P
7440-36-0	Antimony	1.6	U		P
7440-38-2	Arsenic	1.5	B	J	P
7440-39-3	Barium	97.6	B	E J	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	84000			P
7440-47-3	Chromium	0.78	B	J	P
7440-48-4	Cobalt	0.40	U		P
7440-50-8	Copper	1.3	B	J	P
7439-89-6	Iron	8.7	U		P
7439-92-1	Lead	0.70	U		P
7439-95-4	Magnesium	35300			P
7439-96-5	Manganese	8.8	B		P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	1.1	B	J	P
7440-09-7	Potassium	3230	B	E J	P
7782-49-2	Selenium	2.9	U		P
7440-22-4	Silver	0.70	U		P
7440-23-5	Sodium	42900			P
7440-28-0	Thallium	2.6	U		P
7440-62-2	Vanadium	0.40	B	UJ	P
7440-66-6	Zinc	2.5	B	J	P

Case 11/7/02 Casekson

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: DISSOLVED

U. S. EPA-CLP
-1-
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
SW03PB
SW-6
CAE 11/7/02

Lab Name: COMPUCHEM Contract: ______

Lab Code: LIBRTY Case No.: ______ SAS No.: ______ SDG No.: RU1067

Matrix (soil/water): WATER Lab Sample ID: RU1067-4

Level (low/med): LOW Date Received: 9/19/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	57.7	U		P
7440-36-0	Antimony	1.6	U		P
7440-38-2	Arsenic	1.3	U		P
7440-39-3	Barium	69.7	~~B~~	~~E~~ J	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	98900			P
7440-47-3	Chromium	0.60	U		P
7440-48-4	Cobalt	0.40	U		P
7440-50-8	Copper	1.1	~~B~~	J	P
7439-89-6	Iron	8.7	U		P
7439-92-1	Lead	0.70	U		P
7439-95-4	Magnesium	42900			P
7439-96-5	Manganese	46.9			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	0.80	~~B~~	U	P
7440-09-7	Potassium	2450	~~B~~	~~E~~ J	P
7782-49-2	Selenium	2.9	U		P
7440-22-4	Silver	0.70	U		P
7440-23-5	Sodium	24700			P
7440-28-0	Thallium	2.6	U		P
7440-62-2	Vanadium	0.40	~~U~~	UJ	P
7440-66-6	Zinc	0.70	~~U~~	UJ	P

CAE 11/7/02 — CAErikson

Color Before: COLORLESS Clarity Before: CLEAR Texture: ______

Color After: COLORLESS Clarity After: CLEAR Artifacts: ______

Comments: DISSOLVED

APPENDIX C

Transportation Airbill

FedEx Express **USA Airbill** FedEx Tracking Number 825360779079

Sender's Copy

Date: 9/18/02 — Please print and press hard.

Sender's FedEx Account Number: 2431-0147-6

Sender's Name: Peter Burton — Phone: (317) 718-3688

Company: O & M INC

Address: ~~105 COMMERCE DR STE D~~ 303 N Indiana St — Dept./Floor/Suite/Room

City: DANVILLE — State: IN — ZIP: 46122

Your Internal Billing Reference: 304 — characters will appear on invoice.

Recipient's Name: R. Romadi — Phone: (800) 833 5097

Company: Compuchem

Address: 501 Madison Ave

HOLD at FedEx location, print FedEx address. We cannot deliver to P.O. boxes or P.O. ZIP codes.

Dept./Floor/Suite/Room

City: Cary — State: NC — ZIP: 27513

Peel and Stick FedEx Airbill

See back for application instructions

Questions? Visit our Web site at www.fedex.com

or call 1-800-Go-FedEx® (800)463-3339.

By using this Airbill you agree to the service conditions on the back of this Airbill and in our current Service Guide, including terms that limit our liability.

0165043933

4a Express Package Service — Packages up to 150 lbs. Delivery commitment may be later in some areas.

- [X] FedEx Priority Overnight — Next business morning
- [ ] FedEx Standard Overnight — Next business afternoon
- [ ] FedEx First Overnight — Earliest next business morning delivery to select locations
- [ ] FedEx 2Day* — Second business day
- [ ] FedEx Express Saver* — Third business day

* FedEx Envelope/Letter Rate not available. Minimum charge: One-pound rate

4b Express Freight Service — Packages over 150 lbs. Delivery commitment may be later in some areas.

- [ ] FedEx 1Day Freight* — Next business day
- [ ] FedEx 2Day Freight — Second business day
- [ ] FedEx 3Day Freight — Third business day

* Call for Confirmation:

5 Packaging — * Declared value limit $500

- [ ] FedEx Envelope/Letter*
- [ ] FedEx Pak*
- [X] Other Pkg. — Includes FedEx Box, FedEx Tube, and customer pkg.

6 Special Handling — Include FedEx address in Section 3.

- [ ] SATURDAY Delivery RESTRICTIONS — Available only for FedEx Priority Overnight and FedEx 2Day to select ZIP codes
- [ ] SUNDAY Delivery RESTRICTIONS — Available only for FedEx Priority Overnight to select ZIP codes
- [ ] HOLD Weekday at FedEx Location RESTRICTIONS — Not available with FedEx First Overnight
- [ ] HOLD Saturday at FedEx Location RESTRICTIONS — Available only for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.

- [X] No
- [ ] Yes — As per attached Shipper's Declaration
- [ ] Yes — Shipper's Declaration not required
- [ ] Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg

Dangerous Goods cannot be shipped in FedEx packaging.

- [ ] Cargo Aircraft Only

7 Payment Bill to: Enter FedEx Acct No. or Credit Card No. below

- [ ] Sender — Acct. No. in Section 1 will be billed.
- [ ] Recipient
- [X] Third Party
- [ ] Credit Card
- [ ] Cash/Check

FedEx Acct No. / Credit Card No.: 13558422-3 — Exp. Date

Total Packages	Total Weight	Total Declared Value†
8	489	$ .00

FedEx Use Only

†Our liability is limited to $100 unless you declare a higher value. See back for details.

8 Release Signature Sign to authorize delivery without obtaining signature.

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

402

Rev. Date 7/00 • Part #155812G • ©1994-2000 FedEx • PRINTED IN U.S.A. GBFE 11/00